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APRIL 2003

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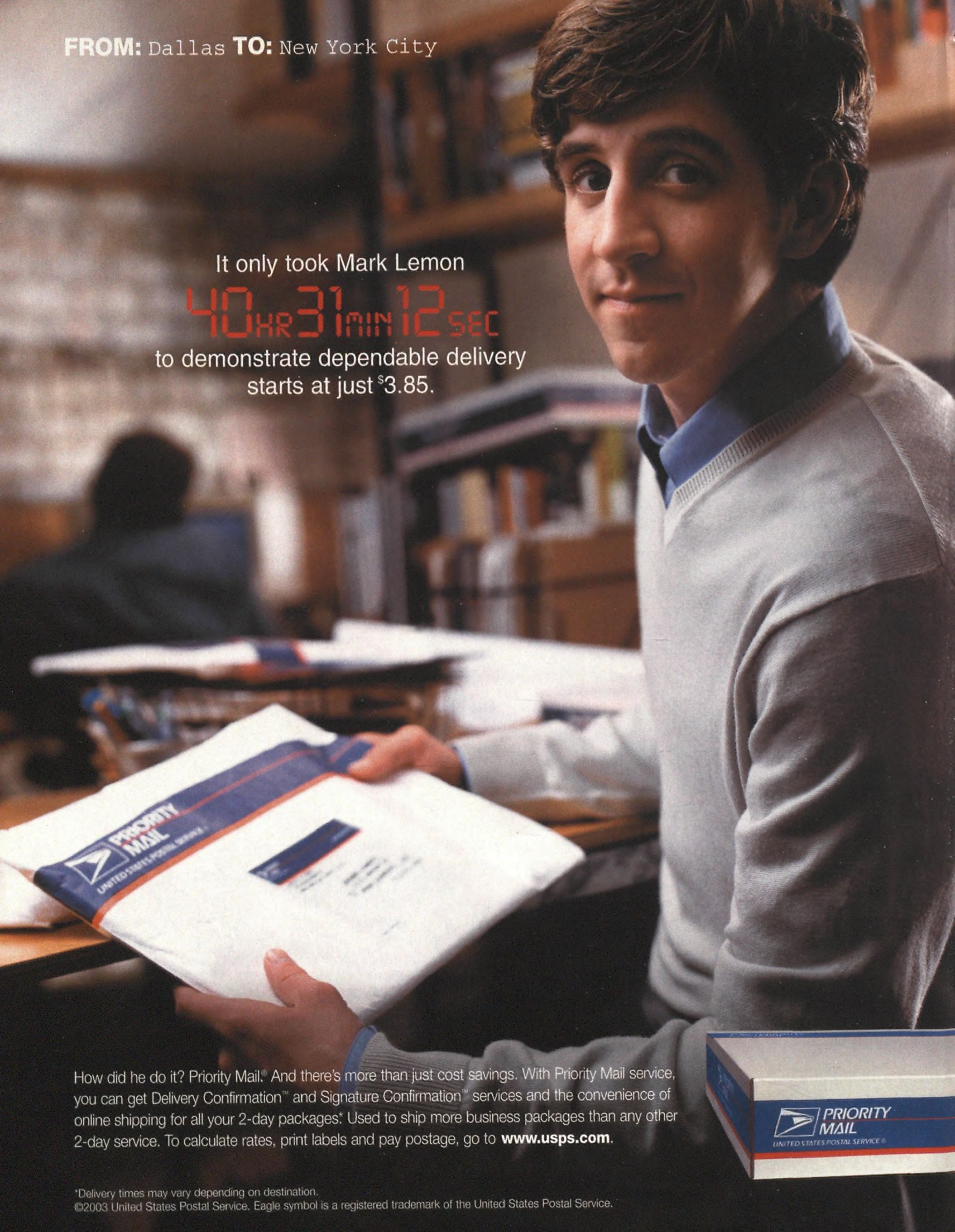
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APRIL 2003 VOLUME 34, NUMBER 1

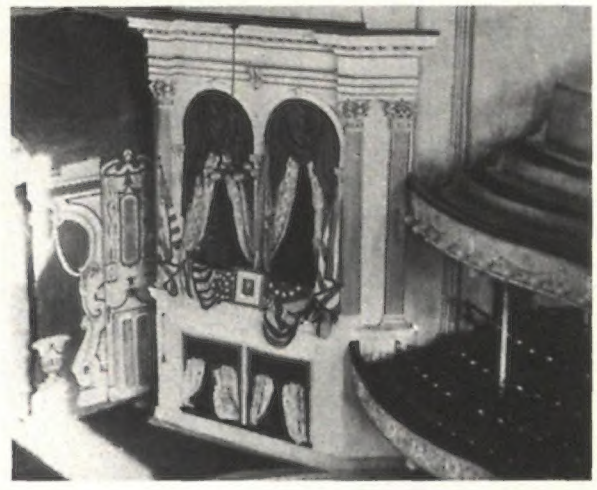
FEATURES

AT NOON WILBUR TRIED AGAIN, and the bobbing and dipping continued. But somehow he found the proper angle for the forward rudder, and the men at the launch rail realized he was not going to come back to the ground right away. He was flying.

—"TO FLY!" PAGE 50

110 Would Lon Chaney, Jr. (in 1943's *Son of Dracula*) approve of the park?

68 For Norway's polar bears, the harsh climate is the least of their worries.



76 Lincoln, says a historian about his going to Ford's Theatre, wanted to "have a laugh."

50 TO FLY!

A new book detailing Wilbur and Orville Wright's efforts to be first in the air reveals their success 100 years ago was no fluke *BY JAMES TOBIN*

65 FABRICATING ART

In photorealistic cloth collages—maples in full leaf, interiors, urban scenes—Laura Breitman is changing the texture of art *BY ANN WILSON LLOYD*

68 BEAR TROUBLE

Though Norway's polar bears live in one of the world's most unforgiving places, it's man, not nature, that's threatening their existence *BY MARLA CONE*

76 MR. LINCOLN'S WASHINGTON

From Ford's Theatre to Lafayette Square, a writer discovers that much of Lincoln's city is still right at our feet *BY CHRISTOPHER BUCKLEY*

88 DEGAS AND HIS DANCERS

Starring in a major show and new ballet, the obsessive artist's delightful ballerinas have leapt back into the limelight *BY PAUL TRACHTMAN*

96 A CONVERSATION WITH MAYA ANGELOU AT 75

The celebrated author of *I Know Why the Caged Bird Sings* reflects on her childhood, family, and astonishingly varied career *BY LUCINDA MOORE*

100 WESTWARD HO!

In perhaps the best real estate deal ever, the United States bought the Louisiana Territory 200 years ago—and forged the nation's destiny *BY JOSEPH HARRISS*

110 THE CURSE OF COUNT DRACULA

Getting a theme park going in Transylvania is like drawing blood from a stone *BY RUDY CHELMINSKI / PHOTOGRAPHS BY ROBERT WALLIS*

ON THE COVER Orville Wright, at the controls of the 600-plus pound Flyer, takes off from Kill Devil Hills at 10:35 a.m. on December 17, 1903. *PHOTOGRAPH FROM BETTMANN / CORBIS.*

100 A new exhibit in New Orleans highlights the long-standing ties between the United States and France. (Detail from Hubert Robert's *The Departure of the Marquis de La Fayette.*)

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DEPARTMENTS

"THE MISSISSIPPI RIVER is probably more famous than the Statue of Liberty. We wouldn't tolerate all this garbage in Yellowstone Park or on the Mall in Washington, D.C., so why should we put up with it here?"
—"TRASH TALKER," PAGE 116

19 "Squashed eggs were everywhere," reported a newspaper of the 1953 White House egg roll.

22 A parent's back is the safest place for newly hatched red-necked grebes.

30 Volunteering to help build a tall ship is a dream fulfilled for boatwright Chris Nistad.

39 Thanks largely to Shirley Sherwood, botanical art (like this painting of pickerelweed) is blooming.

15 INDELIBLE IMAGES *Manhattan Bound* BY MOLLY ROBERTS

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Are red-necked grebes careless—or cunning—parents? BY VALERIE JABLOW

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In building a tall ship, the historic seaport town of Charleston, SC, is rediscovering its long-ignored maritime heritage BY T. EDWARD NICKENS

34 THE OBJECT AT HAND *Power Balls*
As their value soars, signed baseballs have become quite a catch
BY ED LEIBOWITZ

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120 PRESENCE OF MIND *The Stuff of Genes*
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28 JUST LOOKING *Duty Calls*

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128 THE LAST PAGE *Playing by Ear*

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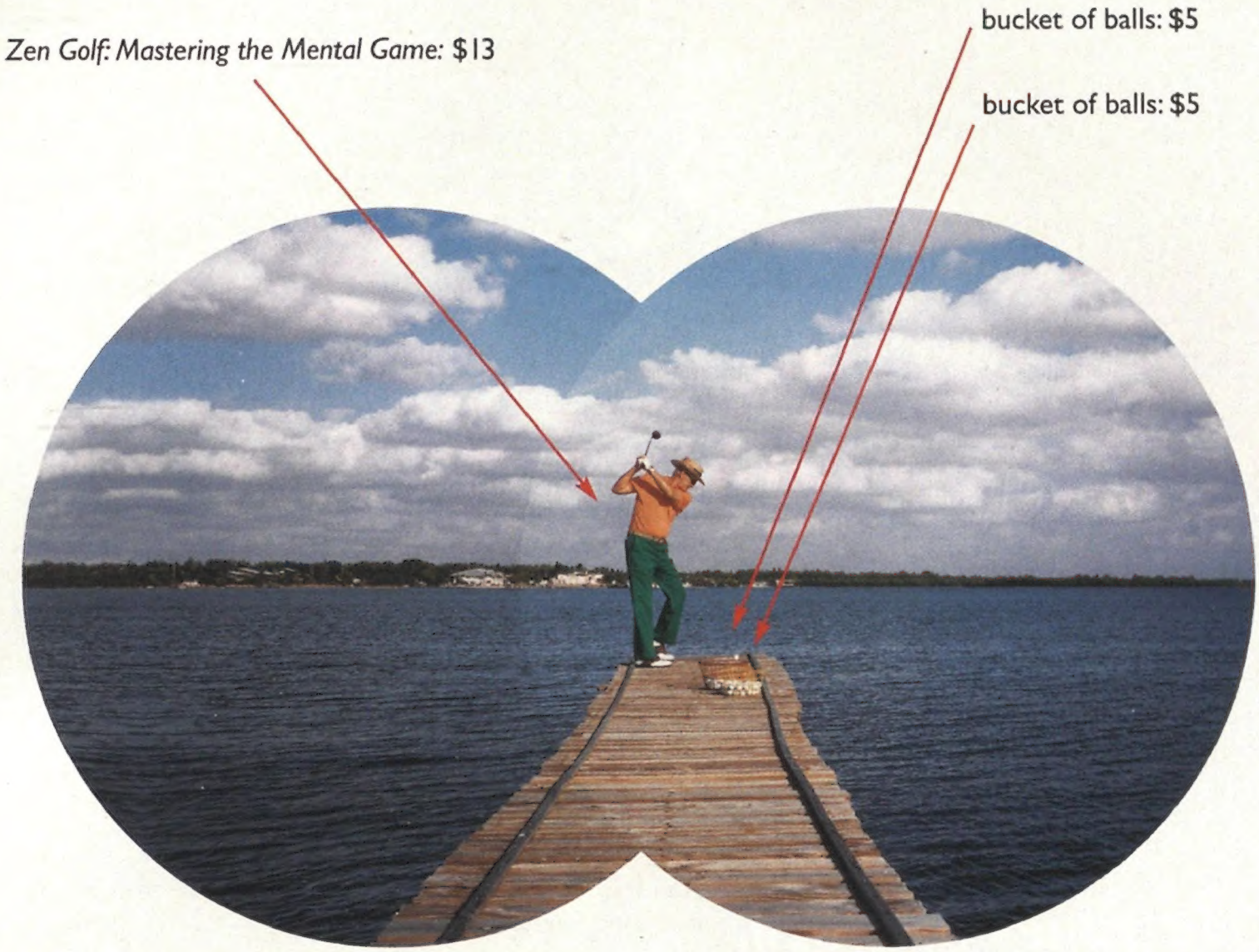

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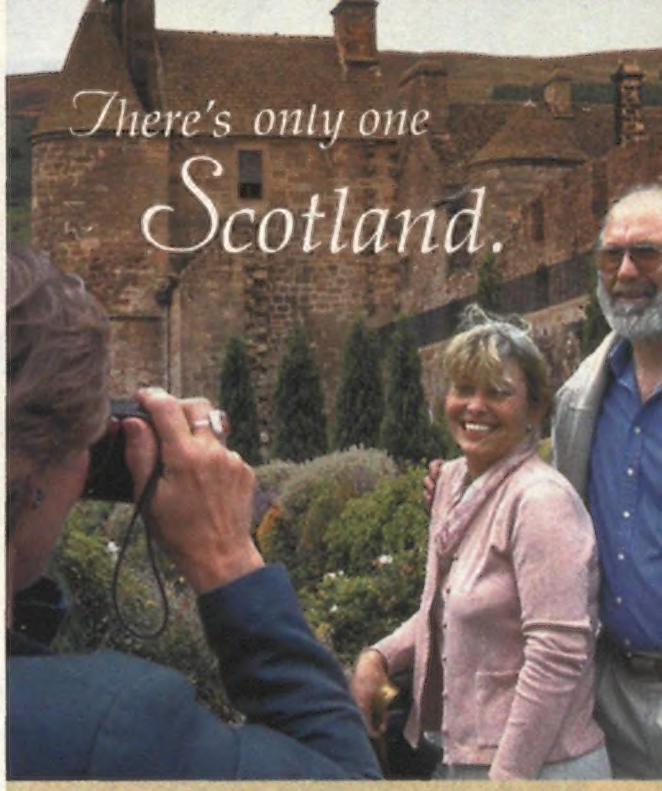

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Exotic Climes

Going the extra mile for bears and bats – BY CAREY WINFREY

ARCTIC BOUND? A few tips: sealskin is warmer than synthetic fleece. Dogsleds outperform snowmobiles. Kayaks are better than motorboats. And pencils are far preferable to pens, which tend not to work at temperatures below freezing. These are a few of the things that Marla Cone, who wrote our piece about polar bears ("Bear Trouble," p. 68) learned on assignment in Svalbard, Norway, 600 miles south of the North Pole. "Arctic people have amazing survival skills," she says, "and they use traditional methods and tools not because such things are quaint, but because they are best suited to the environment."

Cone, with tranquilized mother and cubs: "I felt like I was in some sort of surreal petting zoo."

Cone, a reporter for the *Los Angeles Times* who spent a year and a half on a fellowship to study the Arctic environment, is one of the few visitors to Svalbard to get to see very young polar bear cubs (they stay close to the remote areas to which travel is restricted by the government), never mind interact with them. "At first," she says, "I feared coming closer than a couple of feet. But as I saw them nuzzle Andy [Derocher] and Magnus [Andersen, scientists with the Norwegian Polar Institute], I realized the cubs were harmless. I reached out to pet them—their dark eyes were all innocence and wonder, like the eyes of babies—and it occurred to me that we might be the only human beings they ever see. I felt like I was in some sort of surreal petting zoo, but I never forgot that I was in the bears' environment, a harsh, unforgiving place." She also realized, sadly, that the cubs would likely not live to adulthood—most do not. That is why she went to Svalbard in the first place: to try to find out why these bears have such low survival rates.

RUDY CHELMINSKI FIRST VISITED ROMANIA in 1989 to cover the downfall of that nation's megalomaniacal despot Nicolae Ceausescu, who, with his wife, was ultimately executed by a firing squad following his conviction on charges of mass murder. "Dodging tanks in the snow and keeping my head down for fear of snipers from the dreaded Securitate secret police," says Chelminski, "I joined the international press in the ancient rite of pretending not to be scared in the face of danger." But back again a dozen years later to report our story on the brouhaha over a Count Dracula theme park in the Romanian province of Transylvania ("The Curse of Count Dracula," p. 110), Chelminski found himself "pretending to be scared—that's half the fun—in the candlelit cellar of a decidedly undangerous Dracula-themed restaurant in Bucharest." All things considered, he adds, "I prefer the vicarious thrill to the real one." And that, of course, is the reasoning that led Romania's tourism chief to his controversial plan for a Dracula park. ○

ANDY DEROCHER

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Particulars of Context

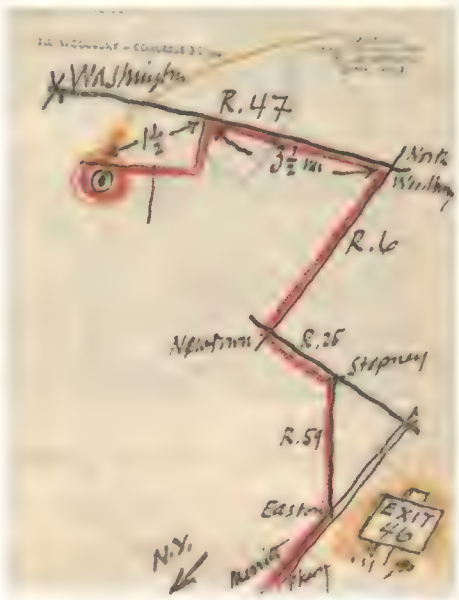
There's art in the history at the Archives of American Art

A WORK OF ART is not absolute and autonomous; it's human, made by an individual for presentation to a world that may embrace or dismiss it, or do neither exactly, or both in turn. To state the obvious: artists and their art exist within a network of circumstances, implicating families, lovers, patrons, pals, collectors, critics, hangers-on, dealers, scholars, institutions, governments. The particulars of the context are no substitute for the art itself, but we're curious about them nonetheless—and for good reason. They situate the artist, complement the art and enlarge our understanding of both. As a repository of evidence of the circumstances in which artists have lived and created, the Smithsonian Archives of American Art is preeminent.

The archives began as a modest enterprise in Detroit in 1954 and became a research unit of the Smithsonian in 1970. Materials are carefully stored in its main office in Washington, and it has regional collecting and research centers in New York and San Marino, California. Banks of the archives' microfilms are available to researchers at the Boston Public Library and the American Art Study Center, M.H. de Young Memorial Museum in San Francisco. The holdings now number some 15 million items, the largest collection of original documents about the history of the visual arts—painting, sculpture, printmaking, crafts, architecture—in the United States from the 18th century to today. Here are letters, diaries, sketches, drawings, photographs, architectural plans, memoirs, oral histories, business records, catalogs, art scholars' notes and more. About a third of the documents have been microfilmed, and they're normally used in that format, though the originals are available to anyone whose inquiry depends on them.

It's hardly surprising that a lengthy sequence of letters or a shoebox of leather-bound diaries will enhance what's known of an epoch. The wonder is that seemingly insubstantial items—a shopping list, a bill of sale, a menu, a Christmas card—bear a burden of meaning too. The archives gathers and preserves this invaluable store, the predictable and the unlikely, for each generation to interpret as it sees fit, and it makes the holdings known both through traditional means, such as published guides, exhibitions and a journal, and, increasingly, through state-of-the-art on-line access.

The name of the archives is, in fact, unduly modest, for its mission embraces not just American art but art in America. So an artist from abroad who only visited this country but left some trace of the stay qualifies for inclusion. Thus, in November 1961, the great Spanish painter Joan Miró sent the American collector Dwight Ripley a drawing and a brief message on a piece of stationery from the Hotel Gladstone in New York City. Miró's name beneath the playful scatter of lines means that art history has to make something of the page. But as with so many items in the archives, the stationery belongs to history too. The information at the top—the name, location, phone number and cable address of the hotel—sends a message from a different America, a pre-zip coded and only partially numeralized place, where the telephone prefix "PLaza 3" had not morphed into "753."



Sculptor Alexander Calder's hand-drawn map to his home looks like one of his mobiles.

There's no mystery to the great appeal of original documents. Set into type the contents of a half-dozen letters (or diary or journal entries) by different hands and they look the same, though their sentiments may differ wildly. Now look at the pages as they were actually written by O'Keeffe, Homer, Pollock, Tanner or any of the thousands of others whose legacy the archives tends. In every rushed or measured line, in the scrawl or precision of the script, in emendations and second-guesses, in sentences that sit gracefully on the page or loop about its edges, you can discern the character of an individual mind. And once you begin, you may be hooked. You've heard the archives' siren song: "read on."

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Readers respond to the February issue:

ENDING POLIO

READING "Mission Impossible?" I could not help but remember the tireless efforts of my husband, Albert Sabin, developer of the oral polio vaccine, to personally promote National Days of Immunization in Brazil, my native country, Cuba, the Dominican Republic and Mexico. He was dedicated to the same goal of global eradication of polio to the end of his life. With all due respect to Dr. Donald "D.A." Henderson, whom I greatly admire, I ally myself with the physicians, vaccinators, World Health Organization, Centers for Disease Control and Prevention, UNICEF, Rotary International, United Nations Foundation, Pan American Health Organization, Ted Turner, the Bill & Melinda Gates Foundation and

all "the guys of the good side of the planet" who support the polio eradication effort. As always, Salgado's photographs are worth a million words.

HELOISA SABIN
WASHINGTON, D.C.

WHILE I WAS VERY pleased that you covered the effort to eradicate polio worldwide, I was disappointed that the key role of Rotary International was not mentioned. Since 1985, Rotary, a network of 1.2 million people united in humanitarian service, has committed more than $500 million and thousands of volunteer hours to end the suffering from this crippling and deadly disease. Rotary is now trying to raise an additional $80 million. Contributions may be sent to The Rotary Foundation—Polio, P.O. Box 75133, Chicago, Illinois 60675-5133.

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HEARTFELT PRAISE

THE LITTLE BOOK *Mayan Hearts* ("One From the Heart") is a treasure.

ANN TUBBS
SACHSE, TEXAS

The book is available from the author, Robert M. Laughlin, of the National Museum of Natural History. His e-mail is Laughlin.Robert@nmnh.si.edu —Ed.

HAWAIIAN HERO

I ENJOYED Mary Roach's article ("Going Postal"), even if she is hoping to replace my father on the stamp advisory committee. I have tried for years to get on a stamp, but being the mother of David Eynon's grandson is apparently not enough. These people just won't listen to reason.

SUE EYNON LARK
SILVER SPRING, MARYLAND

DUKE KAHANAMOKU is highly deserving of a commemorative stamp. A four-time Olympic swimmer with five medals, three of which were gold, he appeared in 30 movies, introducing the world to surfing. Several books have been written about him, and a statue of him welcomes the world to Waikiki Beach. Duke is a cultural icon for the people of Hawaii.

DARIN AU
HONOLULU, HAWAII

Mary Roach's essay about who gets to be on U.S. postage stamps was meant, of course, to be humorous. We share your admiration for Mr. Kahanamoku. —Ed.

GULF WAR GESTURE

THE GLORIFICATION of former President Bush before waging war ("The Calm Before Desert Storm") is a sad comment on a violent society. Although there are many reasons the Gulf War was "necessary," thousands of people died. "Deeply spiritual men" fight for peace, not war.

FRANK PARGA
BROOKLYN, NEW YORK

AUTHOR Christopher Buckley may see glory and grace in that photo of Bush the father, but many Americans see a president who lacked the courage to see the job in Iraq through to the end. Had he done so instead of stopping short of real victory, perhaps we would not be faced with fighting the same battle all over again.

JOHN NELSON
SANTA MONICA, CALIFORNIA

Send letters to LettersEd@simag.si.edu or to **Letters, Smithsonian, MRC 951, P.O. Box 37012, Washington, D.C. 20013.** Please include a telephone number and address. Letters may be edited. Send queries about the Smithsonian Institution to info@si.edu or to VIARC, Public Inquiry Mail Service, P.O. Box 37012, Washington, D.C. 20013.

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Pictured: Juston Smart and his dad, Jeff. Juston is a brain-tumor survivor and supporter of the *Ride for Kids* program. For more information, call the Pediatric Brain Tumor Foundation of the United States at 1-800-253-6530, or visit pbtfus.org. ©2001 American Honda Motor Co., Inc.

Manhattan Bound

A new book of photographs by octogenarian Helen Levitt charts her amused view of an ever-evolving New York – BY MOLLY ROBERTS

HELEN LEVITT / POWERHOUSE BOOKS

"After looking at Helen Levitt's photographs," writes novelist and critic Francine Prose, "the street and the city seem, to put it simply, more *interesting*."

HELEN LEVITT, who is 89 years old and is publishing her fifth book of photographs this spring, says that out of the thousands of pictures she has taken over the decades, her favorite is the one at left, from 1982.

Like many of Levitt's photographs, it depicts a moment on a New York City street and a person at a window (not unlike a photographer gazing through a lens, come to think of it). The woman's many-patterned outfit—herringbone hat, houndstooth check jacket, windowpane skirt—vibrates against the cab's checkerboard stripes. The visual pun pays homage to Henri Cartier-Bresson, Levitt's hero and inspiration, who championed the "decisive moment," as he put it, when the artist fixes a "geometric pattern without which the photograph would have been both formless and lifeless." Levitt prefers not to explain her photographs and doesn't even title them. This particular pattern of geometry, she says, was just a "funny accident."

Levitt, who was born in Brooklyn and has always lived in New York, has been called the city's "visual poet laureate" and "queen of the candid street photograph." The publication of a book of previously unpublished Levitt photographs, *Here and There* (powerHouse Books), is an occasion. Though the 110 black-and-white images cover seven decades, they share a remarkably consistent perspective on the curious, sometimes awkward encounters and occurrences that are the heartbeat of urban life. Her point of view is that of a seasoned city dweller, anonymous, uninvolved—amused.

The book, a testament to one of photography's longest careers, is a sort of

Levitt loved to walk, and curbsides, stoops and fire escapes were the stage upon which the "dance of life," as she calls it, played out.

Levitt's photographs (left, a 1940s image from her just-published book) uncannily convey movement and the "flow of time," says curator Shamis, perhaps because Levitt (right, in 1966) also worked as a documentary filmmaker and motion picture editor.

record of New York's evolution through much of the 20th century. Young boys, one wearing knickers, stand with their backs to us, peering into a poolroom. A potbellied man puffs a stogie while a nearby steampipe bellows. Two polyester-clad cronies kibitz while mannequins gyrate in a storefront window in the background. Seen from behind, a couple recline on a lawn in Central Park—he's hairless as well as shirtless, she's wearing a bathing suit—in a crowd of other fresh-air seekers.

What draws people to the photographer's work is its spontaneity and deceptive simplicity, says Bob Shamis, curator of prints and photographs at the Museum of the City of New York: "It's as though Helen Levitt discovered a secret formula more than 60 years ago for picturing emotional time and emotional reality in lyrical images that are as straightforward as any fact."

As a teenager, Levitt aspired to be an artist, dropped out of high school, turned to photography after realizing she couldn't draw, and took a job in the Bronx assisting a commercial photographer. She sought out the renowned documentarian Walker Evans in 1938, after seeing his photographs of Cuba, and briefly worked with him. Her first solo exhibition, in 1943, was at the Museum of Modern Art, and her photographs appeared in Edward Steichen's landmark 1955 show, *Family of Man*.

Another crucial influence on her early career was James Agee, author of the seminal nonfiction work *Let Us Now Praise Famous Men*, on which he collaborated with Evans. Agee and Levitt teamed up on her first book of photographs, *A Way of Seeing*, which they finished in 1946 but was not published for 19 years; the book languished when the original publisher died and was printed only after Agee's 1957 novel, *A Death in the Family*, boosted interest in his work. Agee said Levitt's photographs were "unpretentious" and had the immediacy of folk art. They were, he said, "as beautiful, perceptive, satisfying and enduring as any lyrical work that I know."

Levitt loved to walk and favored Spanish Harlem and the Lower East Side neighborhoods, where curbsides, stoops and fire escapes were the stage upon which the "dance of life," as she put it, played out. Some critics have called Levitt's photographs aloof or detached, but others find the same quality praiseworthy. Levitt sometimes used a device called a right-angle viewfinder, enabling her to photograph a scene not in front of the camera but off to the side, thus capturing people unawares. "Many of [Levitt's] pictures have a miraculous quality, as if she wasn't there at all," Maria Morris Hambourg, a curator at the Metropolitan Museum of Art, recently told National Public Radio.

Many of Levitt's photographs depict the unself-conscious energy and grace of children; in recent interviews she has lamented the popularity of television, saying it robs neighborhoods of street life. She still takes photographs—of animals, in sync with her advocating more humane treatment of them. A very private person, she lives in a Greenwich Village apartment with her cat, Binky.

It's impossible, of course, to look at Levitt's decades-spanning photographic portrait of New York without thinking about September 11. Though her photographs are noted for their gritty, unsentimental quality, even the young ruffians have an innocence we might not have noticed before. Then again, kids still poke their heads out of ground-floor windows on warm days, and vendors still hawk cotton candy at street fairs. Levitt's work—those delightful dances caught on film—seems to say: be here now. ○

MOLLY ROBERTS, a photographer, is SMITHSONIAN's associate picture editor.

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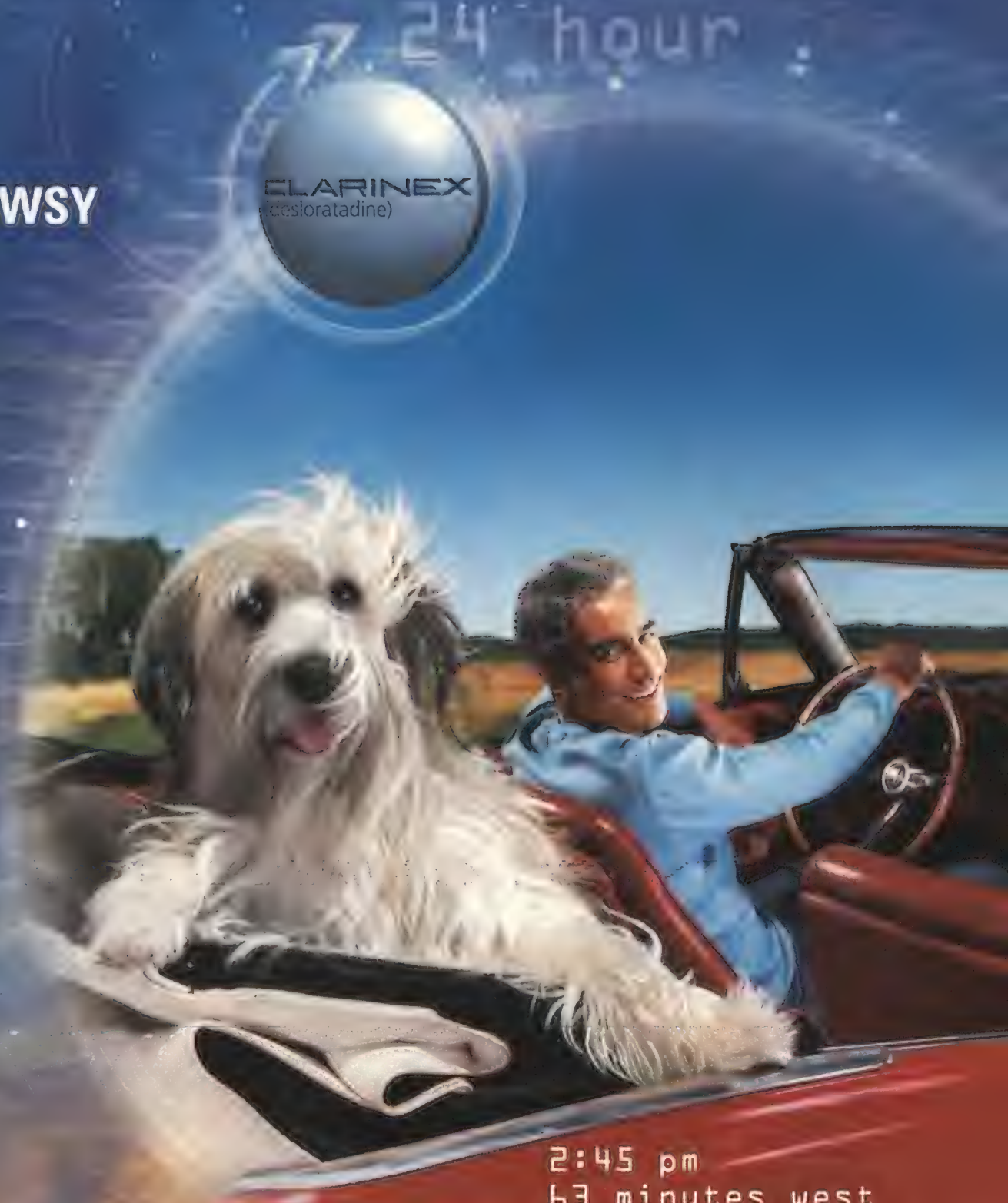

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TABLETS

Brief Summary (For full Prescribing Information, see package insert.)

INDICATIONS AND USAGE: Allergic Rhinitis: CLARINEX Tablets 5 mg are indicated for the relief of the nasal and non-nasal symptoms of allergic rhinitis (seasonal and perennial) in patients 12 years of age and older.

Chronic Idiopathic Urticaria: CLARINEX Tablets are indicated for the symptomatic relief of pruritus, reduction in the number of hives, and size of hives, in patients with chronic idiopathic urticaria 12 years of age and older.

CONTRAINDICATIONS: CLARINEX Tablets 5 mg are contraindicated in patients who are hypersensitive to this medication or to any of its ingredients, or to loratadine.

PRECAUTIONS: Carcinogenesis, Mutagenesis, Impairment of Fertility: The carcinogenic potential of desloratadine was assessed using loratadine studies. In an 18-month study in mice and a 2-year study in rats, loratadine was administered in the diet at doses up to 40 mg/kg/day in mice (estimated desloratadine and desloratadine metabolite exposures were approximately 3 times the AUC in humans at the recommended daily oral dose) and 25 mg/kg/day in rats (estimated desloratadine and desloratadine metabolite exposures were approximately 30 times the AUC in humans at the recommended daily oral dose). Male mice given 40 mg/kg/day loratadine had a significantly higher incidence of hepatocellular tumors (combined adenomas and carcinomas) than concurrent controls. In rats, a significantly higher incidence of hepatocellular tumors (combined adenomas and carcinomas) was observed in males given 10 mg/kg/day and in males and females given 25 mg/kg/day. The estimated desloratadine and desloratadine metabolite exposures of rats given 10 mg/kg of loratadine were approximately 7 times the AUC in humans at the recommended daily oral dose. The clinical significance of these findings during long-term use of desloratadine is not known.

In genotoxicity studies with desloratadine, there was no evidence of genotoxic potential in a reverse mutation assay (*Salmonella/E. coli* mammalian microsome bacterial mutagenicity assay) or in two assays for chromosomal aberrations (human peripheral blood lymphocyte clastogenicity assay and mouse bone marrow micronucleus assay).

There was no effect on female fertility in rats at desloratadine doses up to 24 mg/kg/day (estimated desloratadine and desloratadine metabolite exposures were approximately 130 times the AUC in humans at the recommended daily oral dose). A male specific decrease in fertility, demonstrated by reduced female conception rates, decreased sperm numbers and motility, and histopathologic testicular changes, occurred at an oral desloratadine dose of 12 mg/kg in rats (estimated desloratadine exposures were approximately 45 times the AUC in humans at the recommended daily oral dose). Desloratadine had no effect on fertility in rats at an oral dose of 3 mg/kg/day (estimated desloratadine and desloratadine metabolite exposures were approximately 8 times the AUC in humans at the recommended daily oral dose).

Pregnancy Category C: Desloratadine was not teratogenic in rats at doses up to 48 mg/kg/day (estimated desloratadine and desloratadine metabolite exposures were approximately 210 times the AUC in humans at the recommended daily oral dose) or in rabbits at doses up to 60 mg/kg/day (estimated desloratadine exposures were approximately 230 times the AUC in humans at the recommended daily oral dose). In a separate study, an increase in preimplantation loss and a decreased number of implantations and fetuses were noted in female rats at 24 mg/kg (estimated desloratadine and desloratadine metabolite exposures were approximately 120 times the AUC in humans at the recommended daily oral dose). Reduced body weight and slow righting reflex were reported in pups at doses of 9 mg/kg/day or greater (estimated desloratadine and desloratadine metabolite exposures were approximately 50 times or greater than the AUC in humans at the recommended daily oral dose). Desloratadine had no effect on pup development at an oral dose of 3 mg/kg/day (estimated desloratadine and desloratadine metabolite exposures were approximately 7 times the AUC in humans at the recommended daily oral dose). There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, desloratadine should be used during pregnancy only if clearly needed.

Nursing Mothers: Desloratadine passes into breast milk, therefore a decision should be made whether to discontinue nursing or to discontinue desloratadine, taking into account the importance of the drug to the mother.

Pediatric Use: The safety and effectiveness of CLARINEX Tablets in pediatric patients under 12 years of age have not been established.

Geriatric Use: Clinical studies of desloratadine did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences between the elderly and younger patients. In general, dose selection for an elderly patient should be cautious, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy. (see **CLINICAL PHARMACOLOGY – Special Populations**).

Information for Patients: Patients should be instructed to use CLARINEX Tablets as directed. As there are no food effects on bioavailability, patients can be instructed that CLARINEX Tablets may be taken without regard to meals. Patients should be advised not to increase the dose or dosing frequency as studies have not demonstrated increased effectiveness at higher doses and somnolence may occur.

ADVERSE REACTIONS: Allergic Rhinitis: In multiple-dose placebo-controlled trials, 2,834 patients received CLARINEX Tablets at doses of 2.5 mg to 20 mg daily, of whom 1,655 patients received the recommended daily dose of 5 mg. In patients receiving 5 mg daily, the rate of adverse events was similar between CLARINEX and placebo-treated patients. The percent of patients who withdrew prematurely due to adverse events was 2.4% in the CLARINEX group and 2.6% in the placebo group. There were no serious adverse events in these trials in patients receiving desloratadine. All adverse events that were reported by greater than or equal to 2% of patients who received the recommended daily dose of CLARINEX Tablets (5.0 mg once-daily), and that were more common with CLARINEX Tablet than placebo, are listed in Table 5.

Table 5

Incidence of Adverse Events Reported by ≥ 2% of Allergic Rhinitis Patients in Placebo-Controlled, Multiple-Dose Clinical Trials

Adverse Experience	CLARINEX Tablets 5 mg (n=1,655)	Placebo (n=1,652)
Pharyngitis	4.1%	2.0%
Dry Mouth	3.0%	1.9%
Myalgia	2.1%	1.8%
Fatigue	2.1%	1.2%
Somnolence	2.1%	1.8%
Dysmenorrhea	2.1%	1.6%

The frequency and magnitude of laboratory and electrocardiographic abnormalities were similar in CLARINEX and placebo-treated patients.

There were no differences in adverse events for subgroups of patients as defined by gender, age, or race.

Chronic Idiopathic Urticaria: In multiple-dose, placebo-controlled trials of chronic idiopathic urticaria, 211 patients received CLARINEX Tablets and 205 received placebo. Adverse events that were reported by greater than or equal to 2% of patients who received CLARINEX Tablets and that were more common with CLARINEX than placebo were (rates for CLARINEX and placebo, respectively): headache (14%, 13%), nausea (5%, 2%), fatigue (5%, 1%), dizziness (4%, 3%), pharyngitis (3%, 2%), dyspepsia (3%, 1%), and myalgia (3%, 1%).

The following spontaneous adverse events have been reported during the marketing of desloratadine: tachycardia, and rarely hypersensitivity reactions (such as rash, pruritus, urticaria, edema, dyspnea, and anaphylaxis), and elevated liver enzymes including bilirubin.

DRUG ABUSE AND DEPENDENCE: There is no information to indicate that abuse or dependency occurs with CLARINEX Tablets.

OVERDOSAGE: Information regarding acute overdosage is limited to experience from clinical trials conducted during the development of the CLARINEX product. In a dose ranging trial, at doses of 10 mg and 20 mg/day somnolence was reported.

Single daily doses of 45 mg were given to normal male and female volunteers for 10 days. All ECGs obtained in this study were manually read in a blinded fashion by a cardiologist. In CLARINEX-treated subjects, there was an increase in mean heart rate of 9.2 bpm relative to placebo. The QT interval was corrected for heart rate (QT_c) by both the Bazett and Fridericia methods. Using the QT_c (Bazett) there was a mean increase of 8.1 msec in CLARINEX-treated subjects relative to placebo. Using QT_c (Fridericia) there was a mean increase of 0.4 msec in CLARINEX-treated subjects relative to placebo. No clinically relevant adverse events were reported.

In the event of overdose, consider standard measures to remove any unabsorbed drug. Symptomatic and supportive treatment is recommended. Desloratadine and 3-hydroxydesloratadine are not eliminated by hemodialysis.

Lethality occurred in rats at oral doses of 250 mg/kg or greater (estimated desloratadine and desloratadine metabolite exposures were approximately 120 times the AUC in humans at the recommended daily oral dose). The oral median lethal dose in mice was 353 mg/kg (estimated desloratadine exposures were approximately 290 times the human daily oral dose on a mg/m^2 basis). No deaths occurred at oral doses up to 250 mg/kg in monkeys (estimated desloratadine exposures were approximately 810 times the human daily oral dose on a mg/m^2 basis).

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THIS MONTH IN HISTORY

APRIL ANNIVERSARIES—MOMENTOUS OR MERELY MEMORABLE

30 YEARS AGO: TOWERING SYMBOL
At the dedication of the newly completed Twin Towers, April 4, 1973, project architect Minoru Yamasaki called the World Trade Center a "living symbol of man's dedication to world peace." Yamasaki died in 1986 at 73.

15 YEARS AGO: BRAVE NEW MOUSE
The first animal ever patented was Harvard University's "Oncomouse," a genetically engineered rodent prone to tumors and used in cancer testing. Though the prospect of patenting animals aroused public fears of monster creations, the once-shocking idea is now routine: since 1988, U.S. officials have issued more than 300 animal patents.

40 YEARS AGO: CITIZEN CHURCHILL
Saying he was the most "honorable man to walk the stage of human history in the time in which we live," President John F. Kennedy proclaimed Winston Churchill, 88, an honorary U.S. citizen. Churchill, who did not attend the ceremony (and would die two years later), replied that America and Britain had "stood together, and because of that fact the free world now stands."

125 YEARS AGO: SLIDE
A member of Chicago's Engine Company 21, in a hayloft when an alarm sounded, grabbed a long pole and slid down it to a horse-drawn cart below. Impressed, Captain David Kenyon installed a rounded, waxed beam between the first and second stories through a hole in the ceiling—and a firehouse fixture was born. With today's trend toward one-story stations, the fire pole may itself be sliding into history.

100 YEARS AGO: BLACK POWER
W.E.B. Du Bois' *The Souls of Black Folk* boldly argued that African-Americans gain "civic equality," including better access to the ballot box and higher education. The 1903 book established Du Bois, a sociologist, as a pioneering activist and famously predicted that "the problem of the 20th century is the problem of the color-line."

50 YEARS AGO: IKE'S PIVOTAL ROLL
"Squashed eggs were everywhere," the *Washington Post* reported when some 28,000 children and adults assembled on the White House lawn in the first Easter Egg Roll there in 12 years. The holiday tradition, dating at least to 1878, was suspended at the start of World War II. When President Eisenhower reinstated the event, an adult could attend only in the company of a child; luckily, one could be rented for 25 cents.

CLOCKWISE FROM TOP LEFT: BRUNO BARBEY / MAGNUM PHOTOS; BROWN BROTHERS; GRANGER COLLECTION; GEORGE SKADDING / TIMEPIX; BETTMANN / CORBIS; HARVARD MEDICAL SCHOOL

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With a population of fewer than a half-million, Wyoming's 98 thousand square miles of wide-open territory remains undisturbed in several areas. Enter Fort Laramie National Historic Site and immediately feel as though you've stepped back in time. Buildings have been restored with extreme care.

Almost any western wagon train re-enactment has to make a stop at the fort, as it was a focal point of all the famous historic trails – Oregon, California, Mormon – along with the Pony Express and Bozeman Trail. Singer/songwriter Michael Martin Murphy joined a recent trek up the Bozeman. While preparing to launch from Fort Laramie, Murphy was eager to express his love of the land. "I'm a big believer in reconnecting with nature. The values that you learn from it cannot be learned in any other way," he insists.

Murphy believes many visitors to America's other national parks and historic sites take home only what they see in a small film presentation. "This is the real thing. This is actually feeling it, touching it, living it."

Another touching experience is found at the new National Historic Trails Interpretive Center located up the North Platte River from Fort Laramie in Casper – a town situated at the hub of the entire trail system. Visitors can sit in the back of a wagon and take part in a simulated, and rollicking, river crossing. There is a handcart for the pushing. A massive multi-media presentation opens a center visit, and once completed, modern-day pioneers can then actually be on a historic trail in no time.

"What we have in Wyoming is the landscape. The trail is still here today – the remains themselves, trail ruts, landmarks. You can drive them or walk them. They aren't plowed under or fenced in many areas," notes Jude Carino, center director. "You can have the same experience as emigrants had 150 years ago for hundreds of miles unimpeded."

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Wyoming

Bringing Up Baby

Scientists zero in on the caring and cunning ways of a seldom-seen waterbird – BY VALERIE JABLOW

The back of a red-necked grebe, says biologist Nuechterlein, is like a "floating safe area for the young."

A RED-NECKED GREBE carries on its back a riotously patterned hatchling that appears both eager to explore this new world and reluctant to leave its downy throne. Because red-necks are especially elusive, darting underwater or hiding amid the greenery at water's edge, we seldom get a close look at them, never mind see them in such regal repose.

But wildlife photographer Tom Ulrich has taken some 7,000 pictures of red-necked grebes over seven years at a lake in northwestern Montana. Among his more delightful images are those of an adult red-neck "back brooding"—carrying chicks on its back until they can swim on their own after a week or two. Many waterbirds are famed for their fidelity, and Ulrich says he's seen the same pair return to the lake for several years, although biologists say they do not know how long red-necked grebe couples typically stay together.

As it happens, our appreciation of the birds' parenting and survival skills is being deepened by biologists who recently discovered a behavior among red-necked grebes rarely observed in birds before—after-dark sojourns from the nest that may serve as a handy diversionary tactic.

One of seven grebe species in North America, red-necks acquire their dis-

ALL: TOM J. ULRICH

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Red-necked grebes virtually spoon-feed chicks for up to two months (above), by which time fledglings fish for themselves. Propelled in part by lobed feet, the birds are proficient submariners (below), holding their breath for three minutes or more.

tinctive neck plumage during late fall and also early spring, shortly before they mate and build nests along the edges of lakes, ponds and slow-moving streams and rivers ranging from Alaska to Wisconsin and Michigan. They winter in coastal waters from California to Alaska and from North Carolina to Newfoundland. One researcher estimates there are at least 45,000 red-necked grebes in North America. Some experts say the population is threatened by pesticides and vanishing habitats; others say the birds are so widely dispersed it isn't known whether their overall numbers are going up or down.

A red-necked grebe is ungainly on land, often stumbling with legs set far back on its body. But it excels in the water. Its lobed feet—a feature that distinguishes it from ducks and loons—

and agile legs provide lots of thrust and minimal drag. Streamlined and strong-boned, they're proficient submariners. Red-necks, which eat everything from worms and shrimp to salamanders and fish, can plunge 30 feet below the water's surface for a meal and can hold their breath for three minutes or more.

Preferring open water, where they are beyond the reach of predators such as raccoon and mink, red-necks move close to shore to breed. It's a perilous trade off, affording the animals cattails, reeds and other vegetation for building a nest but also putting them and their eggs in harm's way. In separate field studies, Bruce Eichhorst, of the University of Nebraska, and Gary Nuechterlein, of North Dakota State University, found that brooding red-necked grebes often abandoned their nests for hours at night, probably as a security measure. Eichhorst, working at the Agassiz National Wildlife Refuge in Minnesota, placed plastic eggs containing a sensor and transmitter in nests alongside real eggs; the nests stayed warm some of the night, indicating the parents were there, but then suddenly cooled off, presumably after the birds skipped out. Biologists had previously observed such absenteeism in only a few bird species and have assumed that it would chill the eggs disastrously. "A lot of people think bird embryos will die under these conditions, but these don't," Eichhorst says.

Though the parents' action may seem careless, the researchers speculate that the birds are evading nocturnal predators. It's not clear whether the birds are just trying to save their own skin or protect their eggs by diverting attention from the nest—or both. Regardless, it's a very unusual trick, says Nuechterlein, who has used temperature probes to monitor grebe nests in North Dakota. "This was surprising," he says. "After 20 years of studying grebes, I would have thought they were on their nest 95 percent of the time if not disturbed. Who knew?"

The studies widen our view of these birds, which evade enemies with apparent cunning. All indications are that red-necked grebes go to great lengths to care for their young. Once the eggs hatch, a family paddles for open water. The chicks ride on their parents' backs, out of reach of predators such as pike and bass, with mother and father sharing the burden of bringing up babies. ○

Assistant editor VALERIE JABLOW last wrote on astronomer Margaret Geller.

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Nexium®
(esomeprazole magnesium)

Please read this summary carefully, and then ask your doctor about NEXIUM. No advertisement can provide all the information needed to prescribe a drug. This advertisement does not take the place of careful discussions with your doctor. Only your doctor has the training to weigh the risks and benefits of a prescription drug for you.

Nexium® *(esomeprazole magnesium)*

20-MG, 40-MG Delayed-Release Capsules

BRIEF SUMMARY Before prescribing NEXIUM, please see full Prescribing Information. **INDICATIONS AND USAGE** NEXIUM is indicated for the short-term treatment (4 to 8 weeks) in the healing and symptomatic resolution of diagnostically confirmed erosive esophagitis. **CONTRAINDICATIONS** NEXIUM is contraindicated in patients with known hypersensitivity to any component of the formulation or to substituted benzimidazoles. **PRECAUTIONS** Symptomatic response to therapy with NEXIUM does not preclude the presence of gastric malignancy. Atrophic gastritis has been noted occasionally in gastric corpus biopsies from patients treated long-term with omeprazole, of which NEXIUM is an enantiomer. **Information for Patients** NEXIUM Delayed-Release Capsules should be taken at least one hour before meals. For patients who have difficulty swallowing capsules, one tablespoon of applesauce can be added to an empty bowl and the NEXIUM Delayed-Release Capsule can be opened, and the pellets carefully emptied onto the applesauce. The pellets should be mixed with the applesauce and then swallowed immediately. The applesauce used should not be hot and should be soft enough to be swallowed without chewing. The pellets should not be chewed or crushed. The pellet/applesauce mixture should not be stored for future use. Antacids may be used while taking NEXIUM. **Drug Interactions** Esomeprazole is extensively metabolized in the liver by CYP2C19 and CYP3A4. *In vitro* and *in vivo* studies have shown that esomeprazole is not likely to inhibit CYPs 1A2, 2A6, 2C9, 2D6, 2E1 and 3A4. No clinically relevant interactions with drugs metabolized by these CYP enzymes would be expected. Drug interaction studies have shown that esomeprazole does not have any clinically significant interactions with phenytoin, warfarin, quinidine, clarithromycin or amoxicillin. Esomeprazole may potentially interfere with CYP2C19, the major esomeprazole metabolizing enzyme. Coadministration of esomeprazole 30 mg and diazepam, a CYP2C19 substrate, resulted in a 45% decrease in clearance of diazepam. Increased plasma levels of diazepam were observed 12 hours after dosing and onwards. However, at that time, the plasma levels of diazepam were below the therapeutic interval, and thus this interaction is unlikely to be of clinical relevance. Esomeprazole inhibits gastric acid secretion. Therefore, esomeprazole may interfere with the absorption of drugs where gastric pH is an important determinant of bioavailability (eg, ketoconazole, iron salts and digoxin). Coadministration of oral contraceptives, diazepam, phenytoin, or quinidine did not seem to change the pharmacokinetic profile of esomeprazole. **Carcinogenesis, Mutagenesis, Impairment of Fertility** The carcinogenic potential of esomeprazole was assessed using omeprazole studies. In two 24-month oral carcinogenicity studies in rats, omeprazole at daily doses of 1.7, 3.4, 13.8, 44.0 and 140.8 mg/kg/day (about 0.7 to 57 times the human dose of 20 mg/day expressed on a body surface area basis) produced gastric ECL cell carcinoids in a dose-related manner in both male and female rats; the incidence of this effect was markedly higher in female rats, which had higher blood levels of omeprazole. Gastric carcinoids seldom occur in the untreated rat. In addition, ECL cell hyperplasia was present in all treated groups of both sexes. In one of these studies, female rats were treated with 13.8 mg omeprazole/kg/day (about 5.6 times the human dose on a body surface area basis) for 1 year, then followed for an additional year without the drug. No carcinoids were seen in these rats. An increased incidence of treatment-related ECL cell hyperplasia was observed at the end of 1 year (94% treated vs 10% controls). By the second year the difference between treated and control rats was much smaller (46% vs 26%) but still showed more hyperplasia in the treated group. Gastric adenocarcinoma was seen in one rat (2%). No similar tumor was seen in male or female rats treated for 2 years. For this strain of rat no similar tumor has been noted historically, but a finding involving only one tumor is difficult to interpret. A 78-week mouse carcinogenicity study of omeprazole did not show increased tumor occurrence, but the study was not conclusive. Esomeprazole was negative in the Ames mutation test, in the *in vivo* rat bone marrow cell chromosome aberration test, and the *in vivo* mouse micronucleus test. Esomeprazole, however, was positive in the *in vitro* human lymphocyte chromosome aberration test. Omeprazole was positive in the *in vitro* human lymphocyte chromosome aberration test, the *in vivo* mouse bone marrow cell chromosome aberration test, and the *in vivo* mouse micronucleus test. The potential effects of esomeprazole on fertility and reproductive performance were assessed using omeprazole studies. Omeprazole at oral doses up to 138 mg/kg/day in rats (about 56 times the human dose on a body surface area basis) was found to have no effect on reproductive performance of parental animals. **Pregnancy** *Teratogenic Effects. Pregnancy Category B*—Teratology studies have been performed in rats at oral doses up to 280 mg/kg/day (about 57 times the human dose on a body surface area basis) and in rabbits at oral doses up to 86 mg/kg/day (about 35 times the human dose on a body surface area basis) and have revealed no evidence of impaired fertility or harm to the fetus due to esomeprazole. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed. Teratology studies conducted with omeprazole in rats at oral doses up to 138 mg/kg/day (about 56 times the human dose on a body surface area basis) and in rabbits at doses up to 69 mg/kg/day (about 56 times the human dose on a body surface area basis) did not disclose any evidence for a teratogenic potential of omeprazole. In rabbits, omeprazole in a dose range of 6.9 to 69.1 mg/kg/day (about 5.5 to 56 times the human dose on a body surface area basis) produced dose-related increases in embryo-lethality, fetal resorptions, and pregnancy disruptions. In rats, dose-related embryo/fetal toxicity and postnatal developmental toxicity were observed in offspring resulting from parents treated with omeprazole at 13.8 to 138.0 mg/kg/day (about 5.6 to 56 times the human doses on a body surface area basis). There are no adequate and well-controlled studies in pregnant women. Sporadic reports have been received of congenital abnormalities occurring in infants born to women who have received omeprazole during pregnancy. **Nursing Mothers** The excretion of esomeprazole in milk has not been studied. However, omeprazole concentrations have been measured in breast milk of a woman following oral administration of 20 mg. Because esomeprazole is likely to be excreted in human milk, because of the potential for serious adverse reactions in nursing infants from esomeprazole, and because of the potential for tumorigenicity shown for omeprazole in rat carcinogenicity studies, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother. **Pediatric Use** Safety and effectiveness in pediatric patients have not been established. **Geriatric Use** Of the total number of patients who received NEXIUM in clinical trials, 778 were 65 to 74 years of age and 124 patients were ≥ 75 years of age. No overall differences in safety and efficacy were observed between the elderly and younger individuals, and other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out. **ADVERSE REACTIONS** The safety of NEXIUM was evaluated in over 10,000 patients (aged 18-84 years) in clinical trials worldwide including over 7,400 patients in the United States and over 2,600 patients in Europe and Canada. Over 2,900 patients were treated in long-term studies for up to 6-12 months. In general, NEXIUM was well tolerated in both short- and long-term clinical trials. The safety in the treatment of healing of erosive esophagitis was assessed in four randomized comparative clinical trials, which included 1,240 patients on NEXIUM 20 mg, 2,434 patients on NEXIUM 40 mg, and 3,008 patients on omeprazole 20 mg daily. The most frequently occurring adverse events (≥1%) in all three groups was headache (5.5, 5.0, and 3.8, respectively) and diarrhea (no difference among the three groups). Nausea, flatulence, abdominal pain, constipation, and dry mouth occurred at similar rates among patients taking NEXIUM or omeprazole. Additional adverse events that were reported as possibly or probably related to NEXIUM with an incidence < 1% are listed below by body system: ***Body as a Whole:*** abdomen enlarged, allergic reaction, asthenia, back pain, chest pain, chest pain substernal, facial edema, peripheral edema, hot flushes, fatigue, fever, flu-like disorder, generalized edema, leg edema, malaise, pain, rigors; ***Cardiovascular:*** flushing, hypertension, tachycardia; ***Endocrine:*** goiter; ***Gastrointestinal:*** bowel irregularity, constipation aggravated, dyspepsia, dysphagia, dysplasia GI, epigastric pain, eructation, esophageal disorder, frequent stools, gastroenteritis, GI hemorrhage, GI symptoms not otherwise specified, hiccup, melena, mouth disorder, pharynx disorder, rectal disorder, serum gastrin increased, tongue disorder, tongue edema, ulcerative stomatitis, vomiting; ***Hearing:*** earache, tinnitus; ***Hematologic:*** anemia, anemia hypochromic, cervical lymphoadenopathy, epistaxis, leukocytosis, leukopenia, thrombocytopenia; ***Hepatic:*** bilirubinemia, hepatic function abnormal, SGOT increased, SGPT increased; ***Metabolic/Nutritional:*** glycosuria, hyperuricemia, hyponatremia, increased alkaline phosphatase, thirst, vitamin B12 deficiency, weight increase, weight decrease; ***Musculoskeletal:*** arthralgia, arthritis aggravated, arthropathy, cramps, fibromyalgia syndrome, hernia, polymyalgia rheumatica; ***Nervous System/Psychiatric:*** anorexia, apathy, appetite increased, confusion, depression aggravated, dizziness, hypertonia, nervousness, hypoesthesia, impotence, insomnia, migraine, migraine aggravated, paresthesia, sleep disorder, somnolence, tremor, vertigo, visual field defect; ***Reproductive:*** dysmenorrhea, menstrual disorder, vaginitis; ***Respiratory:*** asthma aggravated, coughing, dyspnea, larynx edema, pharyngitis, rhinitis, sinusitis; ***Skin and Appendages:*** acne, angioedema, dermatitis, pruritus, pruritus ani, rash, rash erythematous, rash maculo-papular, skin inflammation, sweating increased, urticaria; ***Special Senses:*** otitis media, parosmia, taste loss, taste perversion; ***Urogenital:*** abnormal urine, albuminuria, cystitis, dysuria, fungal infection, hematuria, micturition frequency, moniliasis, genital moniliasis, polyuria; ***Visual:*** conjunctivitis, vision abnormal. Endoscopic findings that were reported as adverse events include: duodenitis, esophagitis, esophageal stricture, esophageal ulceration, esophageal varices, gastric ulcer, gastritis, hernia, benign polyps or nodules, Barrett's esophagus, and mucosal discoloration. Postmarketing Reports – There have been spontaneous reports of adverse events with postmarketing use of esomeprazole. These reports have included rare cases of anaphylactic reaction. Other adverse events not observed with NEXIUM, but occurring with omeprazole can be found in the omeprazole package insert, **ADVERSE REACTIONS** section. **OVERDOSAGE** A single oral dose of esomeprazole at 510 mg/kg (about 103 times the human dose on a body surface area basis), was lethal to rats. The major signs of acute toxicity were reduced motor activity, changes in respiratory frequency, tremor, ataxia, and intermittent clonic convulsions. There have been no reports of overdose with esomeprazole. Reports have been received of overdosage with omeprazole in humans. Doses ranged up to 2,400 mg (120 times the usual recommended clinical dose). Manifestations were variable, but included confusion, drowsiness, blurred vision, tachycardia, nausea, diaphoresis, flushing, headache, dry mouth, and other adverse reactions similar to those seen in normal clinical experience (see omeprazole package insert-**ADVERSE REACTIONS**). No specific antidote for esomeprazole is known. Since esomeprazole is extensively protein bound, it is not expected to be removed by dialysis. In the event of overdosage, treatment should be symptomatic and supportive. As with the management of any overdose, the possibility of multiple drug ingestion should be considered. For current information on treatment of any drug overdose, a certified Regional Poison Control Center should be contacted. Telephone numbers are listed in the Physicians' Desk Reference (PDR) or local telephone book.

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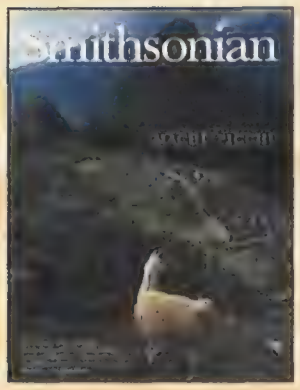

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JUST LOOKING

DUTY CALLS As United Nations inspectors searched for banned weapons in Iraq, these men from the 15th Marine Expeditionary Unit at the San Diego Naval Station said good-bye to their wives before leaving for the Persian Gulf. (Photographed by Hayne Palmour of Gamma, the couples are, left to right, Lance Cpl. Bryan and Rebecca Mitchell, Lance Cpl. John and Angie Sanger, Lance Cpl. Ryan and Melissa Bogedin.) The unit's assault ship, the USS *Tarawa,* was bound for a scheduled six-month tour of duty. But the Marines and their wives were well aware that they might be headed into war instead. By the end of February, more than 180,000 U.S. troops had been sent to the gulf.

HIGH
VOLTAG

The tall ship *Spirit of South Carolina* (its keel laid and ribbing under construction) has opened a window on living traditions.

Hewed from History

In Charleston, South Carolina, shipwrights re-create a 19th-century schooner – BY T. EDWARD NICKENS

UNDER A SOARING WHITE TENT, two volunteers coated in sawdust pull a 15-foot-long oak plank through an eight-foot-tall band saw. Gas-powered planers and circular saws howl and screech. The deafening noise suits the half-dozen men armed with power tools in a makeshift shipyard near the waterfront in Charleston, South Carolina, just fine. When you build a tall ship, you want people to take notice.

The commotion traces back almost three years, when a visit by two-dozen tall ships, in June of 2000, got several Charlestonians lamenting the city's neglect of its own rich maritime heritage. Over beers one night, Mark Bayne, a 43-year-old boatwright, confessed that building such a ship was nothing less than his lifelong dream. His friend Charlie Sneed suggested that he just might be able to set up a non-

PETER FRANK EDWARDS (3)

profit foundation to support such an effort. Soon after, the catalog of historic ship plans the two ordered from the Smithsonian's National Museum of American History set them to work.

Today, a 90-foot pilot schooner is rising, rib by plank, in a former vacant lot between Charleston's historic district and its commercial harbor. Built along the lines—though half again as large—of the *Frances Elizabeth*, an 1879 schooner, *Spirit of South Carolina* is designed to carry 20 young people on extended educational sailing voyages to be organized by the South Carolina Maritime Heritage Foundation and scheduled to begin next year.

The ship is only the most conspicuous aspect of the city's revived interest in its nautical history. A few feet away from her keel, a small-scale maritime museum, the only one of its kind in the state, will soon welcome visitors. More than 150 volunteers have signed on to hoist futtocks (curved ship ribbing), carve wooden belaying pins (cleatlike projections to which ropes are secured) and lead visitors through the shipyard's maze of live-oak and yellow-pine planks. And a once-venerable Charleston shipbuilding family, scattered from the East Coast to the West, has been reunited—all because of one drawing of a long-vanished vessel, purchased from the catalog by mail order for $3. "That single piece of paper sent us on a wonderful journey through the past," says Sneed, "pointing us to pieces of a puzzle that we didn't even know were out there."

The paper was a "lines drawing"—a gridlike diagram based either on a vessel's precise measurements or extrapolated from a ship-model hull—of a ship built, the drawing indicated, by the "Pegnal & Co. shipyard," which neither Sneed nor Bayne had ever heard of.

But a few weeks after the drawing arrived, Sneed discovered, in a book about boats of the American Southeast, a photograph of the pilot schooner *Frances Elizabeth* racing off the coast of Georgia in 1889. Flipping to the book's index, the insurance agent turned recreational sailor found a reference to a "Pregnall" shipyard in 19th-century Charleston. "I sat straight up in my seat," he recalls. "The names—Pegnal and Pregnall—were too close not to match." He grabbed a Charleston telephone book and dialed the only Pregnall listed. To his delight, the man who answered the call turned out to be none other than the great-grandson of shipyard owner Samuel J. Pregnall. And not only was Wally Pregnall, a 42-year-old local hospital employee, well-versed in the history of his ancestor's shipyard, he even owned a map that showed its location, not far from the vacant lot where the *Spirit of South Carolina* is rising today.

"That single piece of paper sent us on a wonderful journey through the past," says Sneed, "pointing us to pieces of a puzzle that we didn't even know were out there."

Construction of the vessel (overseen by Charlie Sneed, left, and Mark Bayne) adhered faithfully to a historic "lines drawing" of the South Carolina schooner *Frances Elizabeth.*

Caught up in the spirit of the *Spirit*, Pregnall began contacting relatives as far away as California to invite them to Charleston for a family reunion, held to coincide with the *Spirit*'s keel-laying ceremony in June 2001. Some 70 members of his far-flung family showed up.

Meanwhile, Sneed had tracked down Randall Swan, great-grandson of the harbor pilot who captained the *Frances Elizabeth* during the Georgia race, and learned that the schooner burned and sank in North Carolina's Cape Fear River in 1912. From Richard Lawrence, chief of North Carolina's underwater archaeology office in the town of Kure Beach, Sneed also discovered that the *Frances Elizabeth*'s likely wreck had been located, by means of sonar surveying, in 1993. An exploratory dive is planned this spring. "Every time we turn around," Bayne says, "the lines drawing leads to something new."

"Lines," as they are known, are part of a massive and growing collection of watercraft plans housed at the Smithsonian's National Museum of American History. There are diagrams of bark ca-

noes, plywood dinghies, clipper ships, sidewheel steamers, skipjacks, tugboats, halibut schooners, whaleboats, mullet skiffs, oyster schooners and warships. The late Howard Irving Chapelle, a naval architect and Smithsonian curator in the 1950s and '60s, collected most of them. In the course of 40 years, he himself drew lines of every major type of working sailing vessel on the Eastern Seaboard and many from the West Coast. In addition, the collection includes lines from several hundreds of vessels and models surveyed through the Historical American Merchant Marine Survey, a 1930s Works Progress Administration program; the William Maxwell Blake Collection of Far East vessel drawings; and a selection of plans for commercial fishing boats built in Seattle, Washington, between 1918 and 1928. New plans are added regularly, donated by ship designers, historians and collections.

At the shipbuilding site, Lee Arthur painted a makeshift mural (depicting work in progress) on the side of a tool-storage tent.

The ship plans are "one of the jewels in our maritime collection," says National Museum of American History curator Paul F. Johnston. "These are the only known records for scores of historic ships that have sunk, been scrapped or were abandoned." The significance of the collection, Johnston adds, is enhanced by its accessibility. Each year, the NMAH mails out 600 or so ship-plan catalogs to the public and, from this source, sells hundreds of construction blueprints. The drawings, which can be purchased for between $3 and $5 per page, are sought by ship designers, historians, underwater archaeologists and ship model makers. Says Johnston: "I think a lot of dreamers buy them to paper the walls of their workshops."

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Some of those dreamers might do well to visit the Charleston waterfront, where the *Spirit*'s creators have set up benches for enthusiasts to watch every rib, spar and rail go up. Since shipbuilding offered neither social prestige nor the fast money that came from plantation-style agriculture, "Charleston's elite kept their backs turned to what went on along the waterfront," says P. C. Coker, author of *Charleston's Maritime Heritage*. "Even today, visitors to the city's museums and houses see nothing to remind them that they are in a seaport, much less such a historic one."

A dream under sail: Florida nautical artist Bill DaCosta painted the *Spirit* as the schooner will appear when completed in 2004.

LIONEL "BILL" DACOSTA

So why are so many people responding to the *Spirit*? "It's not only the sailing crowd that is excited about this," Sneed says, "but locals who remember that a great-grandfather came to America on a great rigged vessel. It's striking a chord with regular people." Some visitors ask for cupfuls of sawdust as mementos. A local woman donated a handcrafted needlepoint pillow to help raise funds. A Florida man shipped up a five-foot-wide painting of the *Spirit*. And the project's list of volunteers continues to grow. "They're like fire ants," says Janet Segal, director of volunteers. "You can't keep them away."

Although local artist Lee Arthur is a regular, only now, as the *Spirit* nears completion—its massive frames lying like gigantic wishbones in a huge grid pattern—has he begun to take in the vessel's full dimensions. "Wow, it's immense!" he exclaims. "I did not have a clue. You know, you'll be able to see this ship from across town."

"Darn right," says Sneed. ○

T. EDWARD NICKENS is a freelance writer based in Raleigh, North Carolina.

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Power Balls

Out of the park: signed balls soar into the stratosphere – BY ED LEIBOWITZ

IN 1927, FIVE-YEAR-OLD ELLIOT SPENCER contracted a life-threatening infection of the blood, causing the New York City Health Department to post a quarantine notice on the door of his family's Bronx apartment. When a microbe-phobic neighbor noticed the sign, she went so far as to sprinkle yellow disinfectant powder on the Spencers' doorstep. As fate would have it, her husband was Doc Woods, the fabled Yankees trainer of the 1920s. Once he discovered what his

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wife had done, Woods roundly chastised his spouse. The next day, a contrite Eugenie Woods showed up at the Spencers' threshold bearing not more sulfurous powder but a baseball that her husband—along with the entire team, including sluggers Lou Gehrig and Babe Ruth—had signed.

The baseball must have possessed curative powers, for young Spencer recovered and grew up to enjoy a career as a chemical engineer, living to age 71. Long before his death in 1994, the baseball had become a family heirloom.

Last year, Elliot's son Brad donated the autographed ball to the Smithsonian's National Museum of American History, adding to the more than 100 baseballs in its collection. "The Spencer family ball is really important," says curator Ellen Roney Hughes, "because it lends a personal story, provides a window into the importance of baseball in the minds and hearts not only of this particular family but also of many Americans."

Other treasures include a 1937 ball signed by Buck Leonard and other players for the Homestead Grays, the legendary Washington, D.C. Negro League team, and a ball bearing the autograph of Jackie Robinson from 1953, six years after he joined the Brooklyn Dodgers and integrated the game. In 1983, Betsy "Sockum" Jochum, an outfielder and pitcher for the All-American Girls Baseball League, donated a baseball inscribed by her team, the 1951 South Bend, Indiana, Blue Sox.

One remarkable acquisition contains the signatures of sluggers from two generations. In 1983, as Hughes conducted a guided tour in the exhibition hall where some of the baseballs are on display, a visitor approached and asked whether she might be interested in a ball signed by both Babe Ruth and Hank Aaron. Would she indeed!

The donor, William P. Mulvaney, now an 81-year-old retired surgeon from Cincinnati, Ohio, recalls that the ball had been given to him by a grateful patient, whose son had owned it when it was signed only by Ruth. Then, when Aaron hit the homer that broke Babe Ruth's lifetime record in 1974, another patient took the ball to Aaron and asked the Atlanta Braves' right fielder to autograph it.

In 1973 a baseball signed by Babe Ruth went for $150 to $225. Today, it would go for a whopping $12,000 to $15,000.

When it came to signing balls for fans, especially kids, Babe Ruth—who would inscribe thousands—was unfailingly generous. Recalled Brooklyn Dodgers manager Burleigh Grimes: "He made sure the little ones got autographs."

Mulvaney, who recalls the day his sons "couldn't find a regular baseball and I caught them going out the door with it," felt the ball belonged in the Smithsonian: "So eventually, there we were, standing before the baseball exhibit, and I realized that they would preserve it here."

The custom of signing baseballs antedated Ruth, of course. But for the first half-century of the game—beginning in the 1870s or so—an autographed ball was quite a rarity. The major leagues ordained that balls were to be kept in play until they were no longer usable, and spectators were obligated to throw back any horsehides that came their way. Not until 1920, the year the Red Sox traded Ruth to the Yankees, did the leagues keep fresh balls in good supply and allow spectators to keep what fell in their laps. Fans, especially kids, began lying in wait after games for players to sign their trophies.

As recently as the 1970s, collectors could nab treasures for modest amounts of money. In 1973, for example, a ball signed by Babe Ruth went for $150 to $225. Today, it's appraised at $12,000 to $15,000. One could pick up a Jackie Robinson-autographed ball for $50; that prize now would fetch $4,000.

"The sport isn't cultivating a new crop of collectors," says James Spence, a leading authenticator of sports memorabilia. (He recently verified a Babe Ruth bat, valued at $250,000.) "Most kids have been pushed out of the hobby. It's strictly for the disposable income crowd now, for people 30 and over."

The evocative power of the signed baseball, however, remains undiminished. "It's possible," says Spence, "to view a player's entire career through the baseballs he signed. For a minor league rookie, the autograph is often hesitant. If a veteran player gains the fame of a Ruth or a Jackie Robinson, the signature will become accomplished from a thousand repetitions." Babe Ruth's signature, he says, "maintained its vibrancy even toward the end of his life," while the autograph of Negro League great Buck Leonard reflected the hardship that overtook the player: "He suffered a stroke which forced him to sign with his right hand instead of his left." ○

ED LEIBOWITZ is a freelance writer based in Los Angeles.

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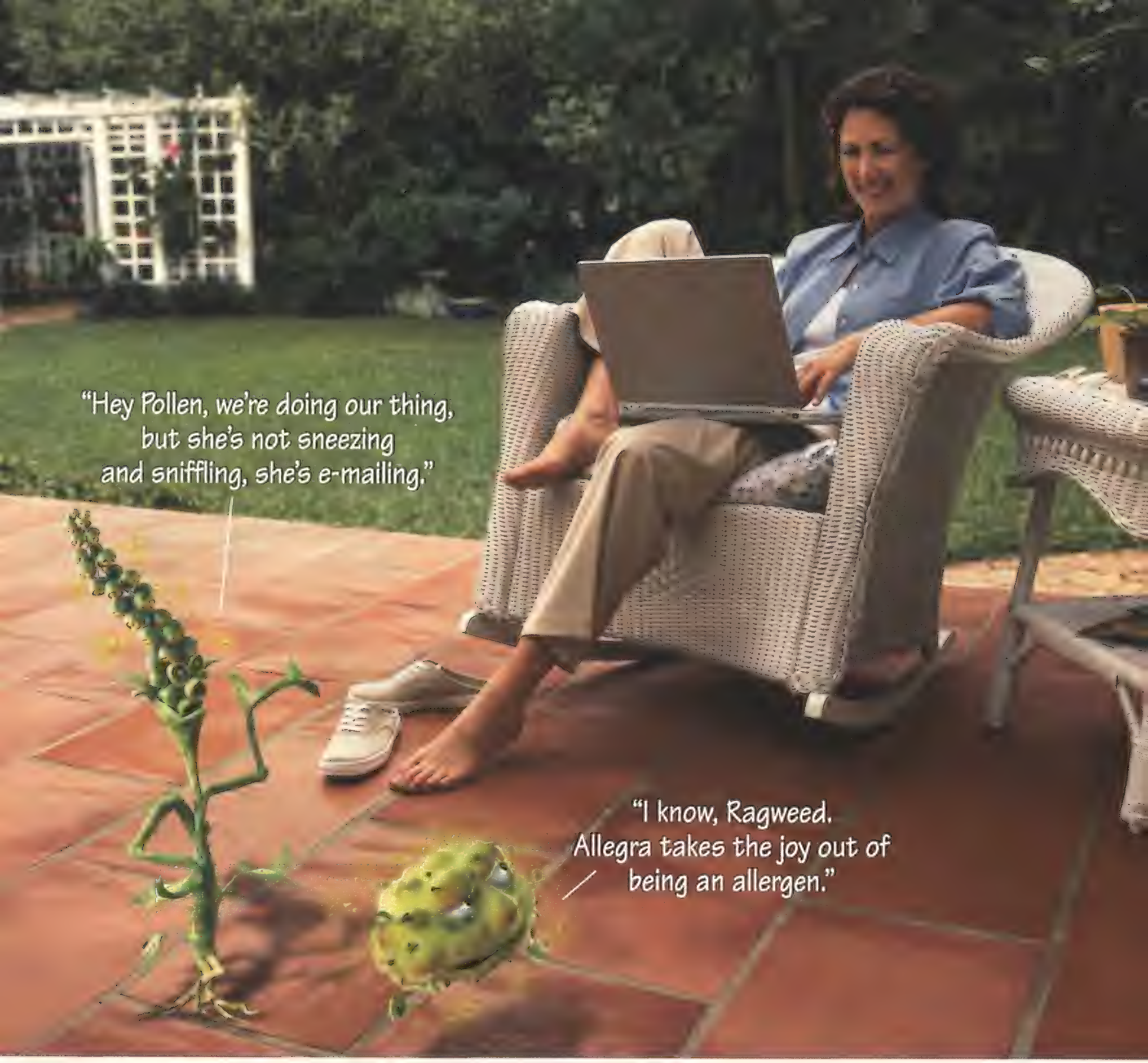
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Brief Summary of Prescribing Information as of November 2000

ALLEGRA®

(fexofenadine hydrochloride)

Capsules and Tablets

INDICATIONS AND USAGE

Seasonal Allergic Rhinitis

ALLEGRA is indicated for the relief of symptoms associated with seasonal allergic rhinitis in adults and children 6 years of age and older. Symptoms treated effectively were sneezing, rhinorrhea, itchy nose/palate/throat, itchy/watery/red eyes

Chronic Idiopathic Urticaria

ALLEGRA is indicated for treatment of uncomplicated skin manifestations of chronic idiopathic urticaria in adults and children 6 years of age and older. It significantly reduces pruritus and the number of wheals.

CONTRAINDICATIONS

ALLEGRA is contraindicated in patients with known hypersensitivity to any of its ingredients.

PRECAUTIONS

Drug Interaction with Erythromycin and Ketoconazole

Fexofenadine hydrochloride has been shown to exhibit minimal (ca 5%) metabolism. However, co-administration of fexofenadine hydrochloride with ketoconazole and erythromycin led to increased plasma levels of fexofenadine hydrochloride. Fexofenadine hydrochloride had no effect on the pharmacokinetics of erythromycin and ketoconazole. In two separate studies, fexofenadine hydrochloride 120 mg twice daily (two times the recommended twice daily dose) was co-administered with erythromycin 500 mg every 8 hours or ketoconazole 400 mg once daily under steady-state conditions to normal, healthy volunteers (n=24 each study). No differences in adverse events or QT interval were observed when patients were administered fexofenadine hydrochloride alone or in combination with erythromycin or ketoconazole. The findings of these studies are summarized in the following table.

Effects on steady-state fexofenadine hydrochloride pharmacokinetics after 7 days of co-administration with fexofenadine hydrochloride 120 mg every 12 hours (two times the recommended twice daily dose) in normal volunteers (n=24)

Concomitant Drug	*C_{maxSS} (Peak plasma concentration)*	*$AUC_{SS0-12hr}$ (Extent of systemic exposure)*
Erythromycin (500 mg every 8 hrs)	+82%	+109%
Ketoconazole (400 mg once daily)	+135%	+164%

The changes in plasma levels were within the range of plasma levels achieved in adequate and well-controlled clinical trials.

The mechanism of these interactions has been evaluated *in vitro*, *in situ*, and *in vivo* animal models. These studies indicate that ketoconazole or erythromycin co-administration enhances fexofenadine gastrointestinal absorption. *In vivo* animal studies also suggest that in addition to increasing absorption, ketoconazole decreases fexofenadine hydrochloride gastrointestinal secretion while erythromycin may also decrease biliary excretion.

Drug Interactions with Antacids

Administration of 120 mg of fexofenadine hydrochloride (2 x 60 mg capsule) within 15 minutes of an aluminum and magnesium containing antacid (Maalox®) decreased fexofenadine AUC by 41% and C_{max} by 43%. ALLEGRA should not be taken closely in time with aluminum and magnesium containing antacids.

Carcinogenesis, Mutagenesis, Impairment of Fertility

The carcinogenic potential and reproductive toxicity of fexofenadine hydrochloride were assessed using terfenadine studies with adequate fexofenadine hydrochloride exposure (based on plasma area-under-the-concentration vs. time [AUC] values). No evidence of carcinogenicity was observed in an 18-month study in mice and in a 24-month study in rats at oral doses up to 150 mg/kg of terfenadine (which led to fexofenadine exposures that were respectively approximately 3 and 5 times the exposure from the maximum recommended daily oral dose of fexofenadine hydrochloride in adults and children).

In *in vitro* (Bacterial Reverse Mutation, CHO/HGPRT Forward Mutation, and Rat Lymphocyte Chromosomal Aberration assays) and *in vivo* (Mouse Bone Marrow Micronucleus assay) tests fexofenadine hydrochloride revealed no evidence of mutagenicity.

In rat fertility studies, dose-related reductions in implants and increases in postimplantation losses were observed at an oral dose of 150 mg/kg of terfenadine (which led to fexofenadine hydrochloride exposures that were approximately 3 times the exposure of the maximum recommended daily oral dose of fexofenadine hydrochloride in adults).

Pregnancy

Teratogenic Effects: Category C. There was no evidence of teratogenicity in rats or rabbits at oral doses of terfenadine up to 300 mg/kg (which led to fexofenadine exposures that were approximately 4 and 31 times, respectively, the exposure from the maximum recommended daily oral dose of fexofenadine in adults). There are no adequate and well controlled studies in pregnant women. Fexofenadine should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nonteratogenic Effects. Dose-related decreases in pup weight gain and survival were observed in rats exposed to an oral dose of 150 mg/kg of terfenadine (approximately 3 times the maximum recommended daily oral dose of fexofenadine hydrochloride in adults based on comparison of fexofenadine hydrochloride AUCs).

Nursing Mothers

There are no adequate and well-controlled studies in women during lactation. Because many drugs are excreted in human milk, caution should be exercised when fexofenadine hydrochloride is administered to a nursing woman.

Pediatric Use

The recommended dose in patients 6 to 11 years of age is based on cross-study comparison of the pharmacokinetics of ALLEGRA in adults and pediatric patients and on the safety profile of fexofenadine hydrochloride in both adult and pediatric patients at doses equal to or higher than the recommended doses.

The safety of ALLEGRA tablets at a dose of 30 mg twice daily has been demonstrated in 438 pediatric patients 6 to 11 years of age in two placebo-controlled 2-week seasonal allergic rhinitis trials. The safety of ALLEGRA for the treatment of chronic idiopathic urticaria in patients 6 to 11 years of age is based on cross-study comparison of the pharmacokinetics of ALLEGRA in adult and pediatric patients and on the safety profile of fexofenadine in both adult and pediatric patients at doses equal to or higher than the recommended dose.

The effectiveness of ALLEGRA for the treatment of seasonal allergic rhinitis in patients 6 to 11 years of age was demonstrated in one trial (n=411) in which ALLEGRA tablets 30 mg twice daily significantly reduced total symptom scores compared to placebo, along with extrapolation of demonstrated efficacy in patients ages 12 years and above, and the pharmacokinetic comparisons in adults and children. The effectiveness of ALLEGRA for the treatment of chronic idiopathic urticaria in patients 6 to 11 years of age is based on an extrapolation of the demonstrated efficacy of ALLEGRA in adults with this condition and the likelihood that the disease course, pathophysiology and the drug's effect are substantially similar in children to that of adult patients.

The safety and effectiveness of ALLEGRA in pediatric patients under 6 years of age have not been established.

Geriatric Use

Clinical studies of ALLEGRA tablets and capsules did not include sufficient numbers of subjects aged 65 years and over to determine whether this population responds differently from younger patients. Other reported clinical experience has not identified differences in responses between the geriatric and younger patients. This drug is known to be substantially excreted by the kidney, and the risk of toxic reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and may be useful to monitor renal function. (See CLINICAL PHARMACOLOGY)

ADVERSE REACTIONS

Seasonal Allergic Rhinitis

Adults. In placebo-controlled seasonal allergic rhinitis clinical trials in patients 12 years of age and older, which included 2461 patients receiving fexofenadine hydrochloride capsules at doses of 20 mg to 240 mg twice daily, adverse events were similar in fexofenadine hydrochloride and placebo-treated patients. All adverse events that were reported by greater than 1% of patients who received the recommended daily dose of fexofenadine hydrochloride (60 mg capsules twice daily), and that were more common with fexofenadine hydrochloride than placebo, are listed in Table 1.

In a placebo-controlled clinical study in the United States, which included 570 patients aged 12 years and older receiving fexofenadine hydrochloride tablets at doses of 120 or 180 mg once daily, adverse events were similar in fexofenadine hydrochloride and placebo-treated patients. Table 1 also lists adverse experiences that were reported by greater than 2% of patients treated with fexofenadine hydrochloride tablets at doses of 180 mg once daily and that were more common with fexofenadine hydrochloride than placebo. The incidence of adverse events, including drowsiness, was not dose-related and was similar across subgroups defined by age, gender, and race.

Table 1

Adverse experiences in patients ages 12 years and older reported in placebo-controlled seasonal allergic rhinitis clinical trials in the United States

Twice daily dosing with fexofenadine capsules at rates of greater than 1%

Adverse experience	*Fexofenadine 60 mg Twice Daily (n=679)*	*Placebo Twice Daily (n=671)*
Viral Infection (cold, flu)	2.5%	1.5%
Nausea	1.6%	1.5%
Dysmenorrhea	1.5%	0.3%
Drowsiness	1.3%	0.9%
Dyspepsia	1.3%	0.6%
Fatigue	1.3%	0.9%

Once daily dosing with fexofenadine hydrochloride tablets at rates of greater than 2%

Adverse experience	*Fexofenadine 180 mg once daily (n=283)*	*Placebo (n=293)*
Headache	10.6%	7.5%
Upper Respiratory Tract Infection	3.2%	3.1%
Back Pain	2.8%	1.4%

The frequency and magnitude of laboratory abnormalities were similar in fexofenadine hydrochloride and placebo-treated patients.

Pediatric. Table 2 lists adverse experiences in patients aged 6 to 11 years of age which were reported by greater than 2% of patients treated with fexofenadine hydrochloride tablets at a dose of 30 mg twice daily in placebo-controlled seasonal allergic rhinitis studies in the United States and Canada that were more common with fexofenadine hydrochloride than placebo.

Table 2

Adverse experiences reported in placebo-controlled seasonal allergic rhinitis studies in pediatric patients ages 6 to 11 in the United States and Canada at rates of greater than 2%

Adverse experience	*Fexofenadine 30 mg twice daily (n=208)*	*Placebo (n=229)*
Headache	7.2%	6.6%
Accidental Injury	2.9%	1.3%
Coughing	3.8%	1.3%
Fever	2.4%	0.9%
Pain	2.4%	0.4%
Otitis Media	2.4%	0.0%
Upper Respiratory Tract Infection	4.3%	1.7%

Chronic Idiopathic Urticaria

Adverse events reported by patients 12 years of age and older in placebo-controlled chronic idiopathic urticaria studies were similar to those reported in placebo-controlled seasonal allergic rhinitis studies. In placebo-controlled chronic idiopathic urticaria clinical trials, which included 726 patients 12 years of age and older receiving fexofenadine hydrochloride tablets at doses of 20 to 240 mg twice daily, adverse events were similar in fexofenadine hydrochloride and placebo-treated patients. Table 3 lists adverse experiences in patients aged 12 years and older which were reported by greater than 2% of patients treated with fexofenadine hydrochloride 60 mg tablets twice daily in controlled clinical studies in the United States and Canada and that were more common with fexofenadine hydrochloride than placebo. The safety of fexofenadine hydrochloride in the treatment of chronic idiopathic urticaria in pediatric patients 6 to 11 years of age is based on the safety profile of fexofenadine hydrochloride in adults and adolescent patients at doses equal to or higher than the recommended dose (see Pediatric Use).

Table 3

Adverse experiences reported in patients 12 years and older in placebo-controlled chronic idiopathic urticaria studies in the United States and Canada at rates of greater than 2%

Adverse experience	*Fexofenadine 60 mg twice daily (n=166)*	*Placebo (n=178)*
Back Pain	2.2%	1.1%
Sinusitis	2.2%	1.1%
Dizziness	2.2%	0.6%
Drowsiness	2.2%	0.0%

Events that have been reported during controlled clinical trials involving seasonal allergic rhinitis and chronic idiopathic urticaria patients with incidences less than 1% and similar to placebo and have been rarely reported during postmarketing surveillance include: insomnia, nervousness, and sleep disorders or paroniria in rare cases, rash, urticaria, pruritus and hypersensitivity reactions with manifestations such as angioedema, chest tightness, dyspnea, flushing and systemic anaphylaxis have been reported.

OVERDOSAGE

Reports of fexofenadine hydrochloride overdose have been infrequent and contain limited information. However, dizziness, drowsiness, and dry mouth have been reported. Single doses of fexofenadine hydrochloride up to 800 mg (six normal volunteers at this dose level), and doses up to 690 mg twice daily for 1 month (three normal volunteers at this dose level) or 240 mg once daily for 1 year (234 normal volunteers at this dose level) were administered without the development of clinically significant adverse events as compared to placebo.

In the event of overdose, consider standard measures to remove any unabsorbed drug. Symptomatic and supportive treatment is recommended.

Hemodialysis did not effectively remove fexofenadine hydrochloride from blood (1.7% removed) following terfenadine administration.

No deaths occurred at oral doses of fexofenadine hydrochloride up to 5000 mg/kg in mice (110 times the maximum recommended daily oral dose in adults and 200 times the maximum recommended daily oral dose in children based on mg/m²) and up to 5000 mg/kg in rats (230 times the maximum recommended daily oral dose in adults and 400 times the maximum recommended daily oral dose in children based on mg/m²). Additionally, no clinical signs of toxicity or gross pathological findings were observed. In dogs, no evidence of toxicity was observed at oral doses up to 2000 mg/kg (300 times the maximum recommended daily oral dose in adults and 530 times the maximum recommended daily oral dose in children based on mg/m²).

Prescribing Information as of November 2000

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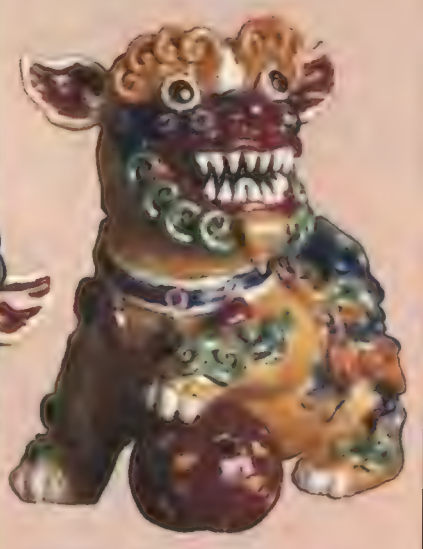

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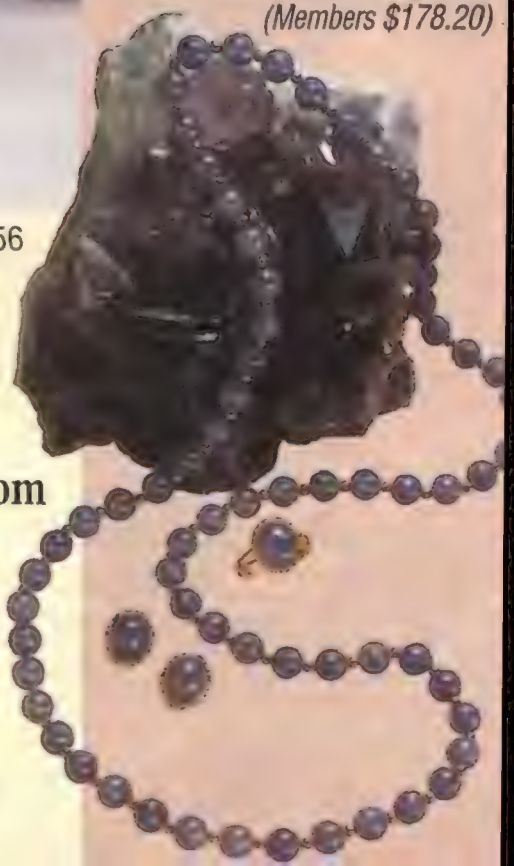

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Wall Flowers

A collector's passion sparks a contemporary rebirth of botanical art

A RARE, PALMLIKE TREE stands in the Kirstenbosch National Botanical Gardens in Cape Town, South Africa, the base of its trunk surrounded by a cage. It is a male cycad, an *Encephalartos woodii*. No female woodiis are known to exist, and the plant hasn't been found in nature since 1916, though hothouse woodiis, all from male offshoots, grace botanical gardens and rare-plant collections worldwide. The cage prevents what botanical art collector Shirley Sherwood calls "mad enthusiasts" from snipping off "pups." The prehistoric species could well end when this 70-year-old specimen and its indoor brethren die.

But the venerable plant has had its portrait painted, and the rendering may be viewed in the exhibition "A Passion for Plants: Botanical Art from the Shirley Sherwood Collection" at the National Museum of Natural History from March 27 to September 2. The watercolor, by Rhode Island artist Leslie Berge, shows only the cycad's crown. The cones glow like gold-dipped pineapples; the fronds stretch fleshily upward until the pale, youngest leaves disappear into ethereal light. The painting is arresting, unearthly, sensuous—and botanically ac-

Leslie Berge's *Cycad: Male Cones of Encephalartos woodii* captures one of the rarest of rare plants.

LESLIE C. BERGE / SHIRLEY SHERWOOD COLLECTION

curate. This marriage of science and aesthetics is what separates a botanical painting from, say, a van Gogh sunflower or an O'Keeffe lily.

It may also be what drew Sherwood to her passion. An Oxford University-trained botanist who was part of the British research team that developed the antiulcer drug Tagamet in the 1970s, she came under the spell of botanical art in 1990 after seeing an exhibition at the Kew Royal Botanic Gardens near London, where she bought her first painting, a pink-and-brown orchid, *Laelia tenebrosa*, by British artist Pandora Sellars. Since then, Sherwood has collected almost 500 works from some 180 artists in 27 countries, helping to spark a renaissance of an art form that grew out of scientific drawings and flourished in the 18th and early 19th centuries.

Susannah Blaxill "falls in love with her subject," says Sherwood. Witness her eggplant (detail below).

But the works in Sherwood's collection are far from scientific illustrations. Instead, she says, these artists "give personality to plants. Some plants are weird and grotesque; some are pretty as a picture." In a painting of a carnivorous pitcher plant, for example, a red-veined flower appears streaked with blood; an enormous pencil-and-watercolor eggplant exudes the absurd dignity of a rhinoceros; a spindly dandelion's head droops forward like that of a too-tall girl (or boy) at a dance. "I've never been able to think of beets quite the same way again," Sherwood says of a painting by Australian Susannah Blaxill that shows a large, gleaming specimen tilting on its axis like a planet.

Painters such as Blaxill and Berge had been communing with beets and cycads in obscurity and isolation until the mid-1990s, when Sherwood began arranging exhibitions, artist seminars and master classes—often at the Orient Express hotels owned by her husband, James. Starting with a single class by New York painter Katie Lee, the master classes of 10 to 20 students have grown to half a dozen a year, taught in Italy, Africa and Australia as well as the United States. Organizations of artists have sprouted in the wake of Sherwood's exhibitions. Even the *Wall Street Journal*, covering her collection, has suggested it's time to invest in botanical art. Says John Kress, head of botany at the Natural History Museum, "Almost single-handedly, she's brought people to appreciate botanical art."

Sherwood says this rebirth of botanical painting has produced art—she cites Australian Paul Jones' "exquisite camellias"—to rival the works of Enlightenment masters such as Georg D. Ehret and Pierre-Joseph Redouté. The difference is that botanical art from the age of exploration expressed the boundless riches of nature; today's works remind us that we may be seeing some of these strange and beautiful plants for the last time.

—KATHLEEN WHEATON

SUSANNAH BLAXHILL / SHIRLEY SHERWOOD COLLECTION; NATIONAL ZOOLOGICAL PARK, S.I

FROM THE ATTIC

KOMODO CHAOS Komo was safe in his new home at the National Zoo in Washington, D.C. with keeper Roy Jennier by his side. A few months earlier, on September 27, 1937, the Komodo dragon had arrived by freighter in New York City after a 12,854-mile journey from Batavia, Java, along with 879 birds, mammals and reptiles that zoo director William M. Mann, Jennier and others had collected in the East Indies. Mann's tales of the nine-month voyage imperiled by gales, an undersea mine and a banana shortage made headlines from Singapore to Halifax. But the best story was of the shipboard escape of the carnivorous, aggressive lizard. "First thing we did," said Mann, "was clear all the birds out of the hatch. The brute would have made short shrift of them." Jennier organized a crew of four who recaptured the reptile. In 1992, the National Zoo became the first zoo in the West to breed Komodos in captivity. Kraken, the first Komodo hatched at the zoo, still lives there with her brother, Precious.

—BETH PY-LIEBERMAN

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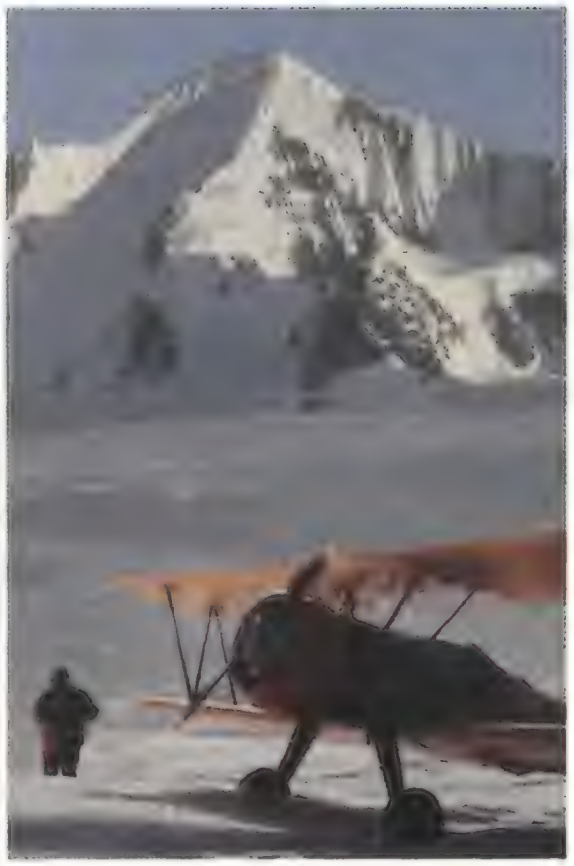
Flight of Fancy

Like his heroes from aviation's golden age, Gus McLeod plans a pole-to-pole flight

FOR THE MOMENT, it sits inside a maintenance hangar at the Baltimore-Washington International Airport: a silver, snub-nosed, twin-engine prop plane. The Beech 18 looks like something you'd use to spirit Humphrey Bogart out of Casablanca. "It was designed in the golden age of aviation," Gus McLeod says wistfully, "when pilots were heroes, and people thought pilots were larger than life."

This October, McLeod, 48, intends to perform a feat right out of that heroic era of the '20s and '30s: he plans to fly his little Beech 18 solo from the South Pole to the North Pole, a 32,000-mile trip, in about two months. It's been done only once before, by Elgen Long in 1971. Long flew a faster, more sophisticated Piper Navajo, and it took him about a month. On McLeod's journey there will be two legs—from Argentina to the South Pole and from Kuala Lumpur, Malaysia, across the Indian Ocean—when he'll have to go some 30 hours and 4,800 miles without so much as an in-flight movie to break the tedium. "Crazier than a bedbug," is how Jerome Hodge describes McLeod. Hodge, president of AvDyne AeroServices, is donating the labor required to tweak and tune the plane for its marathon flight. "Some places in the world that he'll be flying over are so remote, if he goes down, he's *dead*. They won't find him for weeks."



Gus McLeod gained 60 insulating pounds for his North Pole flight, the first in an open-cockpit biplane.

McLeod can deal with that. An entrepreneur who lives in Laytonsville, Maryland, he's a sucker for those bygone days of barnstormers, speed-record challenges and silk scarves flapping in the wind. McLeod knows the life stories of pioneer pilots such as Douglas "Wrong-Way" Corrigan and Roscoe Turner. He wears a throwback bomber jacket and an Indiana Jones fedora. On April 17, 2000, he joined the fraternity of magnificent men in flying machines by becoming the first person to fly around the North Pole in an open-cockpit biplane.

"That was suffering on a biblical scale," McLeod says of the 115-mile-per-hour winds and 50-degrees-below-zero temperatures he encountered. "It was beyond anything I thought I could endure." His instruments froze. He got frostbite on his face and fingers, sores on his belly. He flew on through whiteout conditions and tried to ease his leg cramps with the Lamaze breathing technique his wife, Mary, 48, employed when giving birth to their three children—Gustavus, 23; Hera, 22; and Lara, 11. During one particularly long, lonesome stretch 300 miles from the North Pole, McLeod began to hallucinate. But he kept flying. For 13 days and 3,500 miles. *Solo to the Top of the World,* an account of that ordeal and the peace of mind he found by pushing himself to the limit, will be published this month by Smithsonian Books.

McLeod discovered flying as a boy in Corinth, Mississippi. His Choctaw grandmother, Annie Gray, noticed how he loved things that flew: "She told me my spirit animal must be a bird," he says. "She found some hawk eggs for

WHO'S COUNTING?

250

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imagination at work

me, and we raised the chicks after they hatched. I fed them worms until they were old enough to fly away. And that's what I wanted to do." A battered crop duster pilot named Telford Norman showed him how. Later, McLeod's Methodist minister father moved the family to Washington, D.C., where McLeod studied chemistry at Catholic University and met his future wife. Some days, they walked six miles from campus to the College Park, Maryland, airport so McLeod could take flying lessons. "It was like our 'date,'" says Mary. Four years ago, she took control of the family medical-supply business from her husband so he could devote himself full-time to flying and raising money for his adventures. "He's always been the dreamer in our relationship," she says.

McLeod now has more than 7,000 hours under his belt. Buzzing the North Pole was, he concedes, "selfish." He wanted to prove his mettle, to see if he was made of the same right stuff as his hero Wiley Post, a one-eyed, poor boy from Oklahoma who became the first to fly solo around the world in 1933, and who perished in a 1935 plane crash in Point Barrow, Alaska, with his friend, humorist Will Rogers. But McLeod's pole-to-pole motives are more altruistic. He wants to turn kids on to aviation. "I want to instill in them the magic that I got from it," he says. To that end, he's working with Florida Atlantic University and the Federal Aviation Administration to create a course on aviation history for middle schools. McLeod and his Beech 18 will be part of the lesson. —*TOM DUNKEL*

Solo to the Top of the World *is available for $27.95 from Smithsonian Books. For more information, call 800-782-4612 or visit www.sipress.si.edu.*

NEW UNDER THE SUN In January, astronomers Matthew Holman of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, and J.J. Kavelaars of the National Research Council of Canada in Victoria, British Columbia, announced the discovery of three new moons orbiting Neptune (artist's conception, right). This brings the planet's known satellites to 11. Holman, 35, and Kavelaars, 36, used an elegant solution to find the equivalent of a few pennies in a hay field—the three moons are only 18 to 24 miles wide and 2.8 billion miles from Earth. Using telescopes in Chile and Hawaii, the scientists took images of the sky around Neptune and combined them to make the weak light from any small moons appear brighter. Two interns from McMaster University in Hamilton, Ontario, searched the combined image for the faint points of light amid a background of star trails. Tedious work, yes, but as 21-year-old Wesley Fraser says, "Hell, we were finding *moons*!" England's William Lassell discovered Neptune's satellite Triton in 1846; in 1949, American Gerard Kuiper spotted Nereid; in 1989, Voyager II recorded another six. Now Holman and his colleagues are looking for more moons orbiting Jupiter. Stay tuned. —*BETH PY-LIEBERMAN*

HURRY IN

"Floating World Revealed: Ukiyo-E Paintings and Prints," an exhibition of the Freer Gallery's Edo-period Japanese art, closes May 26. Theaters, bordellos and teahouses flourished in 19th-century Edo (today's Tokyo); the Floating World refers to that realm, inhabited by handsome Kabuki actors and elegant geisha. Ukiyo-E works greatly influenced Western artists. (At left, *Courtesan* by Kaigetsudo Ando, early 18th century.)

DAVID A. AGUILARA / HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS; FREER GALLERY OF ART, S.I.

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If you and your partner are experiencing a decline in sexual activity, it may be the result of erection difficulties, such as erectile dysfunction (ED). Fact is, ED is a common health condition. It can be caused by factors such as high blood pressure, high cholesterol, diabetes, even stress. Fortunately, there is a proven treatment—VIAGRA. **More than 9 million men** have already turned to it.

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VIAGRA is indicated for the treatment of erectile dysfunction. Remember that no medicine is for everyone. If you use nitrate drugs, often used to control chest pain (also known as angina), don't take VIAGRA. This combination could cause your blood pressure to drop to an unsafe or life-threatening level.

Discuss your general health status with your doctor to ensure that you are healthy enough to engage in sexual activity. If you experience chest pain, nausea, or any other discomforts during sex or an erection that lasts longer than 4 hours, seek immediate medical help. The most common side effects of VIAGRA are headache, facial flushing, and upset stomach. Less commonly, bluish vision, blurred vision, or sensitivity to light may briefly occur.

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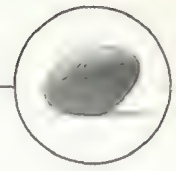

PATIENT SUMMARY OF INFORMATION ABOUT

VIAGRA®
(sildenafil citrate) tablets

This summary contains important information about VIAGRA®. It is not meant to take the place of your doctor's instructions. Read this information carefully before you start taking VIAGRA. Ask your doctor or pharmacist if you do not understand any of this information or if you want to know more about VIAGRA.

This medicine can help many men when it is used as prescribed by their doctors. However, VIAGRA is not for everyone. It is intended for use only by men who have a condition called erectile dysfunction. **VIAGRA must never be used by men who are taking medicines that contain nitrates of any kind, at any time. This includes nitroglycerin. If you take VIAGRA with any nitrate medicine your blood pressure could suddenly drop to an unsafe or life threatening level.**

What Is VIAGRA?

VIAGRA is a pill used to treat erectile dysfunction (impotence) in men. It can help many men who have erectile dysfunction get and keep an erection when they become sexually excited (stimulated).

You will not get an erection just by taking this medicine. VIAGRA helps a man with erectile dysfunction get an erection only when he is sexually excited.

How Sex Affects the Body

When a man is sexually excited, the penis rapidly fills with more blood than usual. The penis then expands and hardens. This is called an erection. After the man is done having sex, this extra blood flows out of the penis back into the body. The erection goes away. If an erection lasts for a long time (more than 6 hours), it can permanently damage your penis. You should call a doctor immediately if you ever have a prolonged erection that lasts more than 4 hours.

Some conditions and medicines interfere with this natural erection process. The penis cannot fill with enough blood. The man cannot have an erection. This is called erectile dysfunction if it becomes a frequent problem.

During sex, your heart works harder. Therefore sexual activity may not be advisable for people who have heart problems. Before you start any treatment for erectile dysfunction, ask your doctor if your heart is healthy enough to handle the extra strain of having sex. If you have chest pains, dizziness or nausea during sex, stop having sex and immediately tell your doctor you have had this problem.

How VIAGRA Works

VIAGRA enables many men with erectile dysfunction to respond to sexual stimulation. When a man is sexually excited, VIAGRA helps the penis fill with enough blood to cause an erection. After sex is over, the erection goes away.

VIAGRA Is Not for Everyone

As noted above (*How Sex Affects the Body*), ask your doctor if your heart is healthy enough for sexual activity.

If you take any medicines that contain nitrates–either regularly or as needed–you should never take VIAGRA. If you take VIAGRA with any nitrate medicine or recreational drug containing nitrates, your blood pressure could suddenly drop to an unsafe level. You could get dizzy, faint, or even have a heart attack or stroke. Nitrates are found in many prescription medicines that are used to treat angina (chest pain due to heart disease) such as:

- nitroglycerin (sprays, ointments, skin patches or pastes, and tablets that are swallowed or dissolved in the mouth)
- isosorbide mononitrate and isosorbide dinitrate (tablets that are swallowed, chewed, or dissolved in the mouth)

Nitrates are also found in recreational drugs such as amyl nitrate or nitrite ("poppers"). If you are not sure if any of your medicines contain nitrates, or if you do not understand what nitrates are, ask your doctor or pharmacist.

VIAGRA is only for patients with erectile dysfunction. VIAGRA is not for newborns, children, or women. Do not let anyone else take your VIAGRA. VIAGRA must be used only under a doctor's supervision.

What VIAGRA Does Not Do

- VIAGRA does not cure erectile dysfunction. It is a treatment for erectile dysfunction.
- VIAGRA does not protect you or your partner from getting sexually transmitted diseases, including HIV–the virus that causes AIDS.
- VIAGRA is not a hormone or an aphrodisiac.

What To Tell Your Doctor Before You Begin VIAGRA

Only your doctor can decide if VIAGRA is right for you. VIAGRA can cause mild, temporary lowering of your blood pressure. You will need to have a thorough medical exam to diagnose your erectile dysfunction and to find out if you can safely take VIAGRA alone or with your other medicines. Your doctor should determine if your heart is healthy enough to handle the extra strain of having sex.

Be sure to tell your doctor if you:

- have ever had any heart problems (e.g., angina, chest pain, heart failure, irregular heart beats, or heart attack)
- have ever had a stroke
- have low or high blood pressure
- have a rare inherited eye disease called retinitis pigmentosa
- have ever had any kidney problems
- have ever had any liver problems
- have ever had any blood problems, including sickle cell anemia or leukemia
- are allergic to sildenafil or any of the other ingredients of VIAGRA tablets
- have a deformed penis, Peyronie's disease, or ever had an erection that lasted more than 4 hours
- have stomach ulcers or any types of bleeding problems
- are taking any other medicines

VIAGRA and Other Medicines

Some medicines can change the way VIAGRA works. Tell your doctor about **any medicines** you are taking. Do not start or stop taking any medicines before checking with your doctor or pharmacist. This includes prescription and nonprescription medicines or remedies. Remember, VIAGRA should never be used with medicines that contain nitrates (see *VIAGRA Is Not for Everyone*). If you are taking a protease inhibitor, your dose may be adjusted (please see *Finding the Right Dose for You.*) VIAGRA should not be used with any other medical treatments that cause erections. These treatments include pills, medicines that are injected or inserted into the penis, implants or vacuum pumps.

Finding the Right Dose for You

VIAGRA comes in different doses (25 mg, 50 mg and 100 mg). If you do not get the results you expect, talk with your doctor. You and your doctor can determine the dose that works best for you.

- Do not take more VIAGRA than your doctor prescribes.
- If you think you need a larger dose of VIAGRA, check with your doctor.
- VIAGRA should not be taken more than once a day.

If you are older than age 65, or have serious liver or kidney problems, your doctor may start you at the lowest dose (25 mg) of VIAGRA. If you are taking protease inhibitors, such as for the treatment of HIV, your doctor may recommend a 25 mg dose and may limit you to a maximum single dose of 25 mg of VIAGRA in a 48 hour period.

How To Take VIAGRA

Take VIAGRA about one hour before you plan to have sex. Beginning in about 30 minutes and for up to 4 hours, VIAGRA can help you get an erection if you are sexually excited. If you take VIAGRA after a high-fat meal (such as a cheeseburger and french fries), the medicine may take a little longer to start working. VIAGRA can help you get an erection when you are sexually excited. You will not get an erection just by taking the pill.

Possible Side Effects

Like all medicines, VIAGRA can cause some side effects. These effects are usually mild to moderate and usually don't last longer than a few hours. Some of these side effects are more likely to occur with higher doses. The most common side effects of VIAGRA are headache, flushing of the face, and upset stomach. Less common side effects that may occur are temporary changes in color vision (such as trouble telling the difference between blue and green objects or having a blue color tinge to them), eyes being more sensitive to light, or blurred vision.

In rare instances, men have reported an erection that lasts many hours. You should call a doctor immediately if you ever have an erection that lasts more than 4 hours. If not treated right away, permanent damage to your penis could occur (see *How Sex Affects the Body*).

Heart attack, stroke, irregular heart beats, and death have been reported rarely in men taking VIAGRA. Most, but not all, of these men had heart problems before taking this medicine. It is not possible to determine whether these events were directly related to VIAGRA.

VIAGRA may cause other side effects besides those listed on this sheet. If you want more information or develop any side effects or symptoms you are concerned about, call your doctor.

Accidental Overdose

In case of accidental overdose, call your doctor right away.

Storing VIAGRA

Keep VIAGRA out of the reach of children. Keep VIAGRA in its original container. Store at room temperature, 59°-86°F (15°-30°C).

For More Information on VIAGRA

VIAGRA is a prescription medicine used to treat erectile dysfunction. Only your doctor can decide if it is right for you. This sheet is only a summary. If you have any questions or want more information about VIAGRA, talk with your doctor or pharmacist, visit www.viagra.com, or call 1-888-4VIAGRA.

23-5515-00-4 June 1999

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Smithsonian
APRIL 2003 VOLUME 34, NUMBER 1

To *Fly!*

A new book traces the Wright brothers' triumph 100 years ago to an innovative design and meticulous attention to detail

BY JAMES TOBIN

"WE LOOK BACK NOW, and it's so obvious that December 17, 1903, was the date flight happened. It wasn't so obvious back then," says James Tobin, author of To Conquer the Air: The Wright Brothers and the Great Race for Flight, *published this month. "The Wrights were just two people, really, among a large number of tinkerers, scientists and adventurers around the world who were fascinated by the problem of flight." At the time, the brothers' claim that they had flown 852 feet in 59 seconds that chilly day at Kitty Hawk was merely one of many reported attempts to fly. It wasn't until Wilbur's historic 1909 flight over Manhattan that the world finally understood what the pair had achieved six years before: piloted flight in a powered airplane.*

The fierce rivalry to be first in the air included far more prominent, better funded men than the Wright brothers, bachelors who owned a bicycle shop in Dayton, Ohio, and lived with their father. Alexander Graham Bell (not satisfied with having invented the telephone) promoted his tetrahedral-cell kites as "possess[ing] automatic stability in the air." Newspapers followed Brazilian Alberto Santos-Dumont as he steered gas-powered airships over Paris beginning in 1898.

Most enthusiasts would have predicted that the innovator of piloted heavier-than-air flight would be the third Secretary of the Smithsonian Institution, the astrophysicist Samuel Pierpont Langley, who held the office from 1887 to 1906. Since 1886, Langley, then 52, had been consumed with the raw

TOPICS OF THE TIMES.

Waiting for the Wrights.

Reports of almost daily flights by the WRIGHT brothers are coming from North Carolina, and, accepting as true only those that claim the least in the way of present achievement, the indications are that the Ohio inventors have devised a real flying machine and have learned how to manage it over short distances.

They still must start from a stretch of railway track, but there are many birds, and some of the ablest among them, that cannot rise from the ground at all, and must have a water surface on which to acquire sufficient impetus to make their wings effective. The WRIGHTS, it is said, hope soon to overcome the present limitations of their machine in this respect, but that is a small matter and might well be left for later consideration.

No end of glory is theirs if they will only do in public what they are said to do when far from expert observation. We are all eager to acclaim them as the conquerors of the air, but their obstinate secrecy makes everybody suspicious and irritable.

By the fall of 1902, the Wright brothers (near Kitty Hawk in October of that year) had solved the most vexing problems of human flight, namely lift and control, with a succession of gliders. Now they were finally ready to focus on propulsion.

Day after day, the brothers (Wilbur, left, and Orville at the controls) put their new and improved glider through its paces. Assistant Dan Tate lent a hand.

science of aeronautics. By 1899, with a large endowment from the U.S. War Department, he was directing an entire staff on the design and construction of his piloted "aerodromes."

Langley and the Wrights, says Tobin, "defined the problem very differently, and Langley got it wrong." He and his young engineer, Charles Manly, concentrated on designing a light, powerful engine; the frame to which they attached it, however, lacked a method for steering. Wilbur and Orville Wright believed that balance and steering defined the problem; it was almost as an afterthought that they added an engine to one of their gliders, which they had been testing since 1900. Ultimately, what separated the Wrights from their more illustrious rivals, wrote Tobin, was "their particular aptitude for learning how to do a difficult thing." Of Wilbur, the author says: "I can't think of anyone who stuck to a plan so carefully, who figured out what he needed to do, and just did it."

The excerpt that follows begins in Dayton in August 1902 as the brothers frantically prepare to turn over their bicycle shop to mechanic Charlie Taylor, 34, and return for their third summer in Kitty Hawk, North Carolina. Wilbur, 35, and Orville, 31, hoped the new glider design they had worked on all winter would finally solve their problem of lift and control.

Adapted from *To Conquer the Air: The Wright Brothers and the Great Race for Flight* by James Tobin © 2003. Reprinted by permission of The Free Press, a division of Simon & Schuster, Inc.

ALL THE PARTS they needed had to be planned correctly in advance and none could be forgotten. Once they reached Kitty Hawk, it would be too late to buy or order anything left behind. They could not make the curved wingtips and ribs themselves. This was work for specialists who made parts for the carriage industry and had the equipment needed for steaming strips of ash, then bending the pliant wood to the required curvature. The Wrights would have handed over sketches with precise dimensions, all based on data from the wind tunnel they built in their shop workroom in the fall of 1901.

They planned to reuse the uprights from their 1901 glider, but everything else had to be new. Most parts they could make themselves from spruce lumber they had ordered cut up into pieces of roughly the right length and shape. Then they went at them with drawknives and spokeshaves, rounding the corners to preserve the wood's essential strength while reducing weight and wind resistance. When this was done, the pieces were ready to be drilled and notched, to make holes for screws and mortises for joining. Then the brothers brushed all the wood parts with several coats of varnish, to protect against the humid North Carolina air. Now the wooden skeleton of the wings could be assembled. In place of screws or nuts and bolts, the brothers used waxed linen cord, an all-purpose twine that conveniently stuck to itself and the wood, making

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THE VILLAGERS, who had regarded the Wright brothers as "a pair of crazy fools," remained dubious about the flying proposition. "We laughed about 'em among ourselves," said John Daniels, one of the regular Kitty Hawk lifeguards.

it easy to tie tight lashings and knots. In a jolting landing, the lashed joints gave a little, then snapped back, minimizing the possibility of broken joints.

Next came the skin, made from yard upon yard of Pride of the West white muslin. This was the trickiest part of the entire job, and it depended entirely on the sewing skills that Susan Wright had taught her sons. Kate, 28, watched, aghast, as her brothers pushed furniture out of the way and filled the first floor of the house with ribs and spars and endless yards of linen. "Will spins the sewing machine around by the hour while Orv squats around marking places to sew. There is no place in the house to live," she wrote to her father, Milton.

They scissored the fabric into strips, then machine-sewed the pieces back together so the threads would run "on the bias" at a 45-degree angle to the ribs. Thus each thread acted as a tiny cross-brace, helping to hold the wing together under the pressures of flight. With painstaking measuring, stretching and sewing, the Wrights created a long, snug pocket for each rib, to keep the fabric anchored and to preserve the wing's precise curvature when it was subjected to the forces of lift. Then, inch by inch, starting at the trailing edge of the wings, they slipped the tight-fitting cloth skin over the wooden skeleton. The tips of the wings were covered separately and required an artist's touch at folding, tucking and stitching.

In search of a remote place where they could test their gliders, the Wrights had first camped at Kitty Hawk, a village in North Carolina's Outer Banks, in September 1900. In July 1901, at Kill Devil Hills, four miles south of Kitty Hawk, they built a shed near a large dune they called the "big hill." The brothers returned to camp August 28, 1902.

A year in the wind had so buckled the Wrights' wooden shed that the roof sloped sharply at either end and the interior, Wilbur reported to their sister, Kate, "strongly resembles the horror of an earthquake in its actual progress." Wilbur and Orville bolstered the shed's sagging floors and built a 16- by 16-foot addition. With a device of their own invention, they drilled the best well in Kitty Hawk, finding "good water" 17 feet down.

In Elizabeth City, the mainland town nearest Kitty Hawk, they had picked up an oven and a barrel of gasoline. Orville had brought a rifle to shoot small waterfowl, so they had occasional fresh meat. To ease the long round-trip between the village and the camp, they had brought a bicycle, in parts, and fussed with the gears so they could ride it over sand. Their shelves were soon stocked with precise rows of canned goods.

"We fitted up our living arrangements much more comfortably than last year," Wilbur wrote to colleague George Spratt. "There are . . . improvements too numerous to mention, and no mosquitoes, so we are having a splendid time."

By this, their third summer, the Wrights were now treated as familiar and welcome guests in Kitty Hawk, though they had not been the easiest men to get to know. "They didn't put themselves out to get acquainted with anybody," said John Daniels, one of the regular lifeguards at the nearby Kill Devil Hills Lifesaving Station. "Just stuck to themselves, and we had to get acquainted with them. I never saw men so wrapped up in their work in my life. After their day's work was over they were different; then they were the nicest fellows you ever saw." The brothers shared good food and asked questions about the land, the weather and the families of the village. They were good with the children. That surely scored points, as did their "uniform courtesy to everyone."

The flying proposition remained dubious among the villagers. Two years earlier, they had regarded the Wrights as "a pair of crazy fools," Daniels said. "We laughed about 'em among ourselves." Sometimes the lifeguards would look over from their post and see the Ohioans standing near the beach, faces upturned, watching intently as gulls soared and banked overhead, even spreading their arms and twisting their wrists in imitation of the birds. An hour later the lifesavers would

Aptitude and perseverance separated the Wright brothers (Orville, left, and Wilbur in 1909) from other would-be conquerors of the sky.

CORBIS

"THE BIRD'S WINGS are undoubtedly very well designed indeed, but it is . . . the marvelous skill with which they are used," Wilbur observed. "The soaring problem is apparently not so much one of better wings as of better operators."

As the winter of 1903 closed in, the Wrights huddled around the stove in their beach shack, waiting for their twisted propeller shafts to be fixed.

look again, and there the brothers would be, still watching the birds.

In fact, the brothers spent less time watching the gulls than they did watching the eagles, hawks and buzzards that soared some distance inland from the crashing waves, above the dunes where the brothers themselves flew. The soaring bird enjoys a perfect balance among the forces of lift, drift and gravity. It was what the brothers aspired to.

Wilbur's favorites were the buzzards, which soared more often than the others. One day, atop the summit of the West Hill, he watched a buzzard at eye level only 75 feet away. It hung all but motionless over the steep slope. Wilbur believed his own artificial wings were—or could be—as good as this bird's. He was less sure he could develop the buzzard's skill. "The bird's wings are undoubtedly very well designed indeed, but it is . . . the marvelous skill with which they are used. . . . The soaring problem is apparently not so much one of better wings as of better operators." To develop that skill remained the brothers' chief desire, and they could attain it only with the prolonged practice that long, safe glides could afford them.

In the shed at Kitty Hawk, the brothers took apart their old glider from the summer of 1901 to make room for their new one. Over 11 days, the machine took shape.

It was an extraordinary work of art, science and craft. It was created to serve a function, so the form, following the function, took on its own ungainly beauty. The leading corners of the wings were quarter-circles, the trailing corners shaped like scoops. In cross-section, the wings humped in front and trailed away in a graceful curve to the rear. The linen skin was taut, the wires tight. Viewed directly from in front or from the side, there was hardly anything to see but a spare collection of lines—horizontal, vertical, diagonal and curved. Only when viewed from above or below did the craft seem substantial, owing to the wings, 32 feet tip to tip and 5 feet front to back. Yet the glider weighed only 112 pounds. Three men could pick it up and carry it with little trouble. "It was built to withstand hard usage," Wilbur said, and though it looked thin and spare, it felt sturdy. When they faced it into a steady breeze, it no longer seemed ungainly. Suddenly they were no longer holding it up but holding it down.

Their first gliders, especially the one built in 1900, had flown as any child's kite flies, with the line at a slanting angle of about 45 degrees. The closer a kite's line ascends to the vertical, the greater the kite's efficiency. One whose cord runs on a vertical line down to the operator is, in effect, soaring. It is aerodynamically perfect. If it could move forward under its own power, it would be *flying*.

On Wednesday, September 10, 1902, the brothers tested the upper wing as a kite. Two days later they tested the lower wing. They found that these curved surfaces, flown by themselves, exerted less pull on the lines than had their 1901 machine. This meant the wind was guiding the wing into a flatter angle of attack, which promised flatter, longer glides.

Next, the brothers assembled the entire glider and carried it to a slope they measured at about seven degrees. In a steady wind, they let out their lines. The glider rose. The lines stood nearly straight up and stayed there.

On the morning of Friday, September 19, Wilbur made the first 25 test glides of the season, with Orville and their assistant, Dan Tate, running alongside with a hand on the wingtips. That day and the next, Wilbur found that slight adjustments in the angle of the new front elevator, a smaller pair of movable wings, offered him control of the glider's fore-and-aft movements.

But the new control device was tricky. To turn up, the operator had to push the elevator-control bar down—the reverse of the 1901 controls. With this movement not yet in-

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ORVILLE STALLED, slid backward and struck the ground wingfirst with a crackle of splintering spruce and ash. "The result was a heap of flying machine, cloth, and sticks, with me in the center without a bruise or a scratch," he wrote in his diary.

stinctive, Wilbur found himself aloft in a cross-gust that caught the left wingtip and pushed it skyward "in a decidedly alarming manner." Wilbur, in confusion, turned the elevator up instead of down and found the glider suddenly "bent on a mad attempt to pierce the heavens." He recovered and landed without damage. But he continued to have problems keeping the wingtips level in crosswinds.

For a long, rainy Sunday the brothers stewed and debated, "at a loss to know what the cause might be." What new forces had they summoned by lengthening the wings and adding a tail? The next day, they retrussed the wings so that the tips dipped slightly below the level of the center section. With this slight arch, the glider took on the droop-winged look of gulls, which fly well in high winds. Kite tests vindicated their intuition. Now crosswinds, if anything, seemed to improve their lateral balance. "The machine flew beautifully," Orville wrote that evening, and "when the proper angle of incidence was attained, seemed to soar."

Lined with foods "selected to [their] own tastes," the shelves of their 1902 camp kitchen testified to the Wrights' obsessive attention to detail.

He began the morning after the wings were retrussed, practicing assisted glides to get the feel of the controls. The tips were so responsive that in one flight he "caused the machine to sway from side to side, sidling one way and then the other a half dozen times in the distance of the glide." Orville managed one respectable flight of 160 feet at an admirably low angle of descent. Then, while concentrating on a wingtip that had risen too high, he lost track of the elevator controls and rushed upward to a height of 25 or 30 feet. Wilbur and Dan Tate cried out. Orville stalled, slid backward and struck the ground wingfirst with a crackle of splintering spruce and ash. "The result was a heap of flying machine, cloth, and sticks, with me in the center without a bruise or a scratch," he wrote in his diary. This "slight catastrophe" meant days of repairs. But that evening the brothers were so pleased with the glider that "we are . . . in a hilarious mood." Orville wrote Kate: "The control will be almost perfect, we think, when we once learn to properly operate the rudders."

The control was not perfect. The winds of the Outer Banks blew in turbulent swirls, and on the dunes there was no lift balance to hold the glider's wings safe and steady. In the next few days, the repaired machine made many more glides under good control. But every so often, "without any apparent reason," one wingtip would rise and fail to respond when the pilot pulled the cables that warped, or twisted, the wings—the key to the Wrights' system of staying balanced in the air. Tilting heavily to one side, the machine would go into a sickening slide sideways in the direction of the tilt. One side of the glider rose and gathered speed, the other side dipped low and slowed, and the whole craft spun into a frightening, out of control circle. The problem was dangerous and bewildering, and they could not claim control of the glider until they had solved it.

To the brothers' delight, their older brother, Lorin Wright, 40, walked into camp on the last day of September, and, equally welcome, George Spratt arrived the next afternoon. The barren expanse of sand increasingly took on the look of a sportman's camp. Spratt and Lorin snagged crabs for bait and caught an eel and some chubs. The three brothers competed in target shooting with Orville's rifle. To the rhythm of the nearby surf, they talked over the evening fire, Lorin lending his own assessments of the glides.

Wilbur climbed to his bunk early, often by 7:30. Orville stayed up later. On the night of October 2, Orville drank more coffee than usual and lay awake for a long time. The glider's curious geometry floated through his mind—and a perception dawned. In the out of control episodes, he saw

WRIGHT STATE UNIVERSITY

December 17, 1903: Orville (at the controls) would describe the flight as "the first . . . in which a machine carrying a man had raised itself by its own power."

that as the glider went into its sideways slide, the fixed vertical tail in the rear not only failed to keep it straight, but it also collided with stationary air, and pushed the machine into its dangerous spin.

Orville glimpsed a solution—make the tail movable. If the pilot entering a turn could alter the tail's angle, then pressure would be relieved on the lower side of the glider and exerted on the higher side. The machine would turn under control and neither slide sideways nor spin.

In the morning, Orville presented his idea. Wilbur saw the point—yes, the tail should be movable. By shifting his hips, the pilot would twist the wings and alter the tail's angle at the same time. Suddenly it was clear to both of them. The two movements were intimately connected and ought to be performed simultaneously. Wing and tail and wind would act in concert.

The skies cleared and the wind blew steady and strong. Spratt had to leave on October 20, leaving the brothers alone with only Dan Tate to help. Wilbur and Orville now looked to see what this glider could do. In five days they made hundreds of glides, stretching their distances to 300, 400, 500 feet in buffeting winds up to 30 miles per hour. On October 23, Wilbur traveled 622 feet in a glide lasting nearly half a minute. Orville bubbled with excitement and pride. "We now hold all the records!" he wrote Kate on the night of October 23. "The largest machine ever handled . . . the longest time in the air, the smallest angle of descent, and the highest wind!!!"

Their long glides had grown out of their aptitude for learning how to do a difficult thing. It was a simple method but rare. They broke a job into its parts and proceeded one part at a time. They practiced each small task until they mastered it, then moved on. The best example was their habit of staying very close to the ground in their glides, sometimes just inches off the sand. "While the high flights were more spectacular, the low ones were fully as valuable for training purposes," Wilbur said. "Skill comes by the constant repetition of familiar feats rather than by a few overbold attempts at feats for which the performer is yet poorly prepared." They were conservative daredevils, cautious prophets. "A thousand glides is equivalent to about four hours of steady practice," Wilbur said, "far too little to give anyone a complete mastery of the art of flying."

LANGLEY AND MANLY had spent most of four years building an extraordinary engine to lift their heavy flying machine. The Wrights had spent most of four years building a flying machine so artfully designed that it could be propelled into the air by a fairly ordinary internal combustion engine. Still, they had expended a minimum of thought and energy on their power plant. At first they hoped simply to buy an en-

BETTMANN / CORBIS

Even for Drs. Schwartz and Kalet, two people familiar with the fragile biology of humans, the inevitable can be an unpleasant subject. Nevertheless, they know **the life cycle can be hard to predict** and the unthinkable is always a possibility. And they wanted to make sure the ones closest to them would be provided for.

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"WE ARE NOW QUITE IN DOUBT as to whether the engine will be able to pull [the Flyer] at all with the present gears," Orville wrote Milton and Kate. The brothers estimated their odds of success at no more than even.

gine. But when they sent inquiries to manufacturers, specifying one of less than 200 pounds that would make at least eight horsepower, only one manufacturer said he had such an engine, and the brothers concluded he was overrating its power. So, back in Dayton in the winter of 1902, they sketched a design of their own and handed it to their bicycle shop machinist Charlie Taylor, who did most of the work in the back room. After six weeks, he produced a simplified four-cylinder auto engine without a carburetor, spark plugs or fuel pump. In February 1903, the engine block cracked in a shop test. When a new block was delivered and the engine reassembled, it made 12 horsepower at 1,025 revolutions per minute. With four more horsepower than the brothers believed they needed, and 20 pounds fewer than their maximum, the engine, said Orville, was "a very pleasant surprise."

The brothers had assumed that propellers would cause them less trouble than the engine, but they soon learned that ships' propellers were designed by trial and error, vessel by vessel. No one knew exactly how they worked, so no one had worked out a theory of propeller design, least of all for flying machines. So the brothers had no choice but to plumb the mystery themselves. They began to consider the problem seriously soon after their return to Dayton from Kitty Hawk in 1902, and "it was not till several months had passed," Orville recalled, "and every phase of the problem had been thrashed over, that the various reactions began to untangle themselves."

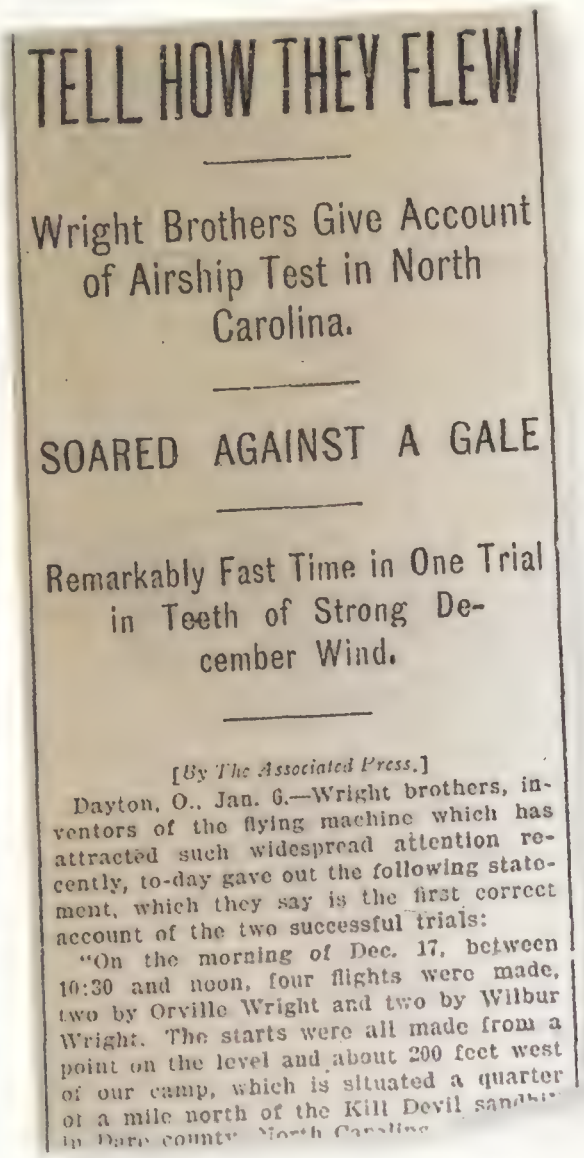
Naval engineers had proposed that a marine propeller cuts through water as a screw cuts through wood. The brothers conceived a different image. To them, "it was apparent that a propeller was simply an aeroplane [that is, a plane surface in the curved shape of a wing] traveling in a spiral course." The problem sounded simple. But, wrote Orville, it "became more complex the longer we studied it. With the machine moving forward, the air flying backward, the propellers turning sidewise, and nothing standing still, it seemed impossible to find a starting-point from which to trace the various simultaneous reactions."

"We worked out a theory," Orville wrote in a June letter to Spratt, "on the subject, and discovered, as we usually do, that all the propellers built heretofore are all wrong, and then built a pair of propellers 8 1/8 ft. in diameter, based on our theory, which are all right! (till we have a chance to test them at Kitty Hawk and find out differently). Isn't it astonishing that all these secrets have been preserved for so many years just so that we could discover them!!"

After waiting days for calm weather, Langley's young engineer, Charles Manly, catapulted his boss's aerodrome off a houseboat moored in the Potomac River near Quantico, Virginia, just after 10 a.m., October 7, 1903. Manly's "indescribable sensation of being free in the air" gave way to "the important fact . . . that the machine was plunging downward at a very sharp angle.' The front wings struck the water and disintegrated." Soon after, back in Kitty Hawk for their fourth season (they returned September 25, 1903), Wilbur wrote to Octave Chanute, a distinguished civil engineer and aviation authority he had befriended: "I see that Langley has had his fling, and failed. It seems to be our turn to throw now, and I wonder what our luck will be."

Until now, construction of what would become their famous "Flyer" had proceeded smoothly. But in a test on November 5, a misfiring engine conspired with loose propellers and loose sprockets to make a disaster. The propeller shafts tore loose from their mountings and twisted. The Wrights had no choice but to send the shafts back to Charlie Taylor to be repaired. Without them, there would be no powered flight for many days, and Chanute, who had arrived in Kitty Hawk November 6 for a visit, said he couldn't stay that long. For his benefit the brothers labored up the slopes to make a few more glides in the 1902 machine. But the wood had grown dry and rickety in the heat of the shed, and they decided the glider was no longer safe. For most of their friend's stay the weather remained so bad the three men did little but sit close to the stove and talk.

Chanute questioned the brothers closely about the mathematical calculations they had used in building their engine, and he didn't like what they told him. Engineers usually allowed for a 20 percent loss of an engine's power, yet the Wrights had only allowed for 5 percent. This worried the brothers. Unable to work because of the missing shafts, "We had lots of time for thinking, and the more we thought, the harder our machine got to running and the less the power of the engine became," Orville wrote to Milton and Kate, "We are now



TELL HOW THEY FLEW

Wright Brothers Give Account of Airship Test in North Carolina.

SOARED AGAINST A GALE

Remarkably Fast Time in One Trial in Teeth of Strong December Wind.

[By The Associated Press.]

Dayton, O., Jan. 6.—Wright brothers, inventors of the flying machine which has attracted such widespread attention recently, to-day gave out the following statement, which they say is the first correct account of the two successful trials:

"On the morning of Dec. 17, between 10:30 and noon, four flights were made, two by Orville Wright and two by Wilbur Wright. The starts were all made from a point on the level and about 200 feet west of our camp, which is situated a quarter of a mile north of the Kill Devil sandhills in Dare county, North Carolina.

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‡"Allegra, Claritin, Zyrtec, Flonase, Nasonex, and Clarinex are among the leading prescription allergic rhinitis products."
Source: Scott-Levin's Source™ Prescription Audit (SPA) from Verispan; October 2001-September 2002.

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Please see important information on the following page.

FLONASE®
(fluticasone propionate)
Nasal Spray, 50 mcg

BRIEF SUMMARY

For Intranasal Use Only. **SHAKE GENTLY BEFORE USE.**

The following is a brief summary only; see full prescribing information for complete product information.

CONTRAINDICATIONS

FLONASE Nasal Spray is contraindicated in patients with a hypersensitivity to any of its ingredients.

WARNINGS

The replacement of a systemic corticosteroid with a topical corticosteroid can be accompanied by signs of adrenal insufficiency, and in addition some patients may experience symptoms of withdrawal, e.g., joint and/or muscular pain, lassitude, and depression. Patients previously treated for prolonged periods with systemic corticosteroids and transferred to topical corticosteroids should be carefully monitored for acute adrenal insufficiency in response to stress. In those patients who have asthma or other clinical conditions requiring long-term systemic corticosteroid treatment, too rapid a decrease in systemic corticosteroids may cause a severe exacerbation of their symptoms.

The concomitant use of intranasal corticosteroids with other inhaled corticosteroids could increase the risk of signs or symptoms of hypercorticism and/or suppression of the hypothalamic-pituitary-adrenal (HPA) axis.

Persons who are using drugs that suppress the immune system are more susceptible to infections than healthy individuals. Chickenpox and measles, for example, can have a more serious or even fatal course in susceptible children or adults using corticosteroids. In children or adults who have not had these diseases or been properly immunized, particular care should be taken to avoid exposure. How the dose, route, and duration of corticosteroid administration affect the risk of developing a disseminated infection is not known. The contribution of the underlying disease and/or prior corticosteroid treatment to the risk is also not known. If exposed to chickenpox, prophylaxis with varicella zoster immune globulin (VZIG) may be indicated. If exposed to measles, prophylaxis with pooled intramuscular immunoglobulin (IG) may be indicated. (See the respective package inserts for complete VZIG and IG prescribing information.) If chickenpox develops, treatment with antiviral agents may be considered.

Avoid spraying in eyes.

PRECAUTIONS

General: Intranasal corticosteroids may cause a reduction in growth velocity when administered to pediatric patients (see PRECAUTIONS: Pediatric Use).

Rarely, immediate hypersensitivity reactions or contact dermatitis may occur after the administration of FLONASE Nasal Spray. Rare instances of wheezing, nasal septum perforation, cataracts, glaucoma, and increased intraocular pressure have been reported following the intranasal application of corticosteroids, including flutocasone propionate.

Use of excessive doses of corticosteroids may lead to signs or symptoms of hypercorticism and/or suppression of HPA function.

Although systemic effects have been minimal with recommended doses of FLONASE Nasal Spray, potential risk increases with larger doses. Therefore, larger than recommended doses of FLONASE Nasal Spray should be avoided.

When used at higher than recommended doses or in rare individuals at recommended doses, systemic corticosteroid effects such as hypercorticism and adrenal suppression may appear. If such changes occur, the dosage of FLONASE Nasal Spray should be discontinued slowly consistent with accepted procedures for discontinuing oral corticosteroid therapy.

In clinical studies with fluticasone propionate administered intranasally, the development of localized infections of the nose and pharynx with *Candida albicans* has occurred only rarely. When such an infection develops, it may require treatment with appropriate local therapy and discontinuation of treatment with FLONASE Nasal Spray. Patients using FLONASE Nasal Spray over several months or longer should be examined periodically for evidence of *Candida* infection or other signs of adverse effects on the nasal mucosa.

Intranasal corticosteroids should be used with caution, if at all, in patients with active or quiescent tuberculous infections of the respiratory tract; untreated local or systemic fungal or bacterial infections; systemic viral or parasitic infections; or ocular herpes simplex.

Because of the inhibitory effect of corticosteroids on wound healing, patients who have experienced recent nasal septal ulcers, nasal surgery, or nasal trauma should not use a nasal corticosteroid until healing has occurred.

Information for Patients: Patients being treated with FLONASE Nasal Spray should receive the following information and instructions. This information is intended to aid them in the safe and effective use of this medication. It is not a disclosure of all possible adverse or intended effects.

Patients should be warned to avoid exposure to chickenpox or measles and, if exposed, to consult their physician without delay.

Patients should use FLONASE Nasal Spray at regular intervals for optimal effect. Some patients (12 years of age and older) with seasonal allergic rhinitis may find as-needed use of 200 mcg once daily effective for symptom control (see Clinical Trials section of full prescribing information).

A decrease in nasal symptoms may occur as soon as 12 hours after starting therapy with FLONASE Nasal Spray. Results in several clinical trials indicate statistically significant improvement within the first day or two of treatment; however, the full benefit of FLONASE Nasal Spray may not be achieved until treatment has been administered for several days. The patient should not increase the prescribed dosage but should contact the physician if symptoms do not improve or if the condition worsens.

For the proper use of FLONASE Nasal Spray and to attain maximum improvement, the patient should read and follow carefully the patient's instructions accompanying the product.

Drug Interactions: In a placebo-controlled, crossover study in 8 healthy volunteers, coadministration of a single dose of orally inhaled fluticasone propionate (1,000 mcg; 5 times the maximum daily intranasal dose) with multiple doses of ketoconazole (200 mg) to steady state resulted in increased mean fluticasone propionate concentrations, a reduction in plasma cortisol AUC, and no effect on urinary excretion of cortisol. This interaction may be due to an inhibition of cytochrome P450 3A4 by ketoconazole, which is also the route of metabolism of fluticasone propionate. No drug interaction studies have been conducted with FLONASE Nasal Spray; however, care should be exercised when fluticasone propionate is coadministered with long-term ketoconazole and other known cytochrome P450 3A4 inhibitors.

Carcinogenesis, Mutagenesis, Impairment of Fertility: Fluticasone propionate demonstrated no tumorigenic potential in mice at oral doses up to 1,000 mcg/kg (approximately 20 times the maximum recommended daily intranasal dose in adults and approximately 10 times the maximum recommended daily intranasal dose in children on a mcg/m² basis) for 78 weeks or in rats at inhalation doses up to 57 mcg/kg (approximately 2 times the maximum recommended daily intranasal dose in adults and approximately equivalent to the maximum recommended daily intranasal dose in children on a mcg/m² basis) for 104 weeks.

Fluticasone propionate did not induce gene mutation in prokaryotic or eukaryotic cells in vitro. No significant clastogenic effect was seen in cultured human peripheral lymphocytes in vitro or in the mouse micronucleus test.

No evidence of impairment of fertility was observed in reproductive studies conducted in male and female rats at subcutaneous doses up to 50 mcg/kg (approximately 2 times the maximum recommended daily intranasal dose in adults on a mcg/m² basis). Prostate weight was significantly reduced at a subcutaneous dose of 50 mcg/kg.

Pregnancy: *Teratogenic Effects:* Pregnancy Category C. Subcutaneous studies in the mouse and rat at 45 and 100 mcg/kg, respectively (approximately equivalent to and 4 times the maximum recommended daily intranasal dose in adults on a mcg/m² basis, respectively) revealed fetal toxicity characteristic of potent corticosteroid compounds, including embryonic growth retardation, omphalocele, cleft palate, and retarded cranial ossification.

In the rabbit, fetal weight reduction and cleft palate were observed at a subcutaneous dose of 4 mcg/kg (less than the maximum recommended daily intranasal dose in adults on a mcg/m² basis). However, no teratogenic effects were reported at oral doses up to 300 mcg/kg (approximately 25 times the maximum recommended daily intranasal dose in adults on a mcg/m² basis) of fluticasone propionate to the rabbit. No fluticasone propionate was detected in the plasma in this study, consistent with the established low bioavailability following oral administration (see CLINICAL PHARMACOLOGY section of full prescribing information).

Fluticasone propionate crossed the placenta following oral administration of 100 mcg/kg to rats or 300 mcg/kg to rabbits (approximately 4 and 25 times, respectively, the maximum recommended daily intranasal dose in adults on a mcg/m² basis).

There are no adequate and well-controlled studies in pregnant women. Fluticasone propionate should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Experience with oral corticosteroids since their introduction in pharmacologic, as opposed to physiologic, doses suggests that rodents are more prone to teratogenic effects from corticosteroids than humans. In addition, because there is a natural increase in corticosteroid production during pregnancy, most women will require a lower exogenous corticosteroid dose and many will not need corticosteroid treatment during pregnancy.

Nursing Mothers: It is not known whether flutocasone propionate is excreted in human breast milk. However, other corticosteroids have been detected in human milk. Subcutaneous administration to lactating rats of 10 mcg/kg of tritiated fluticasone propionate (less than the maximum recommended daily intranasal dose in adults on a mcg/m² basis) resulted in measurable radioactivity in the milk. Since there are no data from controlled trials on the use of intranasal flutocasone propionate by nursing mothers, caution should be exercised when FLONASE Nasal Spray is administered to a nursing woman.

Pediatric Use: Five hundred (500) patients aged 4 to 11 years and 440 patients aged 12 to 17 years were studied in US clinical trials with fluticasone propionate nasal spray. The safety and effectiveness of FLONASE Nasal Spray in children below 4 years of age have not been established.

Controlled clinical studies have shown that intranasal corticosteroids may cause a reduction in growth velocity in pediatric patients. This effect has been observed in the absence of laboratory evidence of HPA axis suppression, suggesting that growth velocity is a more sensitive indicator of systemic corticosteroid exposure in pediatric patients than some commonly used tests of HPA axis function. The long-term effects of this reduction in growth velocity associated with intranasal corticosteroids, including the impact on final adult height, are unknown. The potential for "catch-up" growth following discontinuation of treatment with intranasal corticosteroids has not been adequately studied. The growth of pediatric patients receiving intranasal corticosteriods, including FLONASE Nasal Spray, should be monitored routinely (e.g., via stadiometry). The potential growth effects of prolonged treatment should be weighed against the clinical benefits obtained and the risks/benefits of treatment alternatives. To minimize the systemic effects of intranasal corticosteroids, including FLONASE Nasal Spray, each patient should be titrated to the lowest dose that effectively controls his/her symptoms.

Geriatric Use: A limited number of patients 65 years of age and older (n=129) or 75 years of age and older (n=11) have been treated with FLONASE Nasal Spray in US and non-US clinical trials. While the number of patients is too small to permit separate analysis of efficacy and safety, the adverse reactions reported in this population were similar to those reported by younger patients.

ADVERSE REACTIONS

In controlled US studies, more than 3,300 patients with seasonal allergic, perennial allergic, or perennial nonallergic rhinitis received treatment with intranasal flutocasone propionate. In general, adverse reactions in clinical studies have been primarily associated with irritation of the nasal mucous membranes, and the adverse reactions were reported with approximately the same frequency by patients treated with the vehicle itself. The complaints did not usually interfere with treatment. Less than 2% of patients in clinical trials discontinued because of adverse events; this rate was similar for vehicle placebo and active comparators.

Systemic corticosteroid side effects were not reported during controlled clinical studies up to 6 months' duration with FLONASE Nasal Spray. If recommended doses are exceeded, however, or if individuals are particularly sensitive or taking FLONASE Nasal Spray in conjunction with administration of other corticosteroids, symptoms of hypercorticism, e.g., Cushing syndrome, could occur.

The following incidence of common adverse reactions (>3%, where incidence in fluticasone propionate-treated subjects exceeded placebo) is based upon 7 controlled clinical trials in which 536 patients (57 girls and 108 boys aged 4 to 11 years, 137 female and 234 male adolescents and adults) were treated with FLONASE Nasal Spray 200 mcg once daily over 2 to 4 weeks and 2 controlled clinical trials in which 246 patients (119 female and 127 male adolescents and adults) were treated with FLONASE Nasal Spray 200 mcg once daily over 6 months. Also included in the table are adverse events from 2 studies in which 167 children (45 girls and 122 boys aged 4 to 11 years) were treated with FLONASE Nasal Spray 100 mcg once daily for 2 to 4 weeks.

Overall Adverse Experiences With >3% Incidence on Fluticasone Propionate in Controlled Clinical Trials With FLONASE Nasal Spray in Patients ≥4 Years With Seasonal or Perennial Allergic Rhinitis

Adverse Experience	Vehicle Placebo (n=758) %	FLONASE 100 mcg Once Daily (n=167) %	FLONASE 200 mcg Once Daily (n=782) %
Headache	14.6	6.6	16.1
Pharyngitis	7.2	6.0	7.8
Epistaxis	5.4	6.0	6.9
Nasal burning/ nasal irritation	2.6	2.4	3.2
Nausea/vomiting	2.0	4.8	2.6
Asthma symptoms	2.9	7.2	3.3
Cough	2.8	3.6	3.8

Other adverse events that occurred in ≤3% but ≥1% of patients and that were more common with fluticasone propionate (with uncertain relationship to treatment) included: blood in nasal mucus, runny nose, abdominal pain, diarrhea, fever, flu-like symptoms, aches and pains, dizziness, bronchitis.

Observed During Clinical Practice: In addition to adverse events reported from clinical trials, the following events have been identified during postapproval use of fluticasone propionate in clinical practice. Because they are reported voluntarily from a population of unknown size, estimates of frequency cannot be made. These events have been chosen for inclusion due to either their seriousness, frequency of reporting, or causal connection to fluticasone propionate or a combination of these factors.

General: Hypersensitivity reactions, including angioedema, skin rash, edema of the face and tongue, pruritus, urticaria, bronchospasm, wheezing, dyspnea, and anaphylaxis/anaphylactoid reactions, which in rare instances were severe.

Ear, Nose, and Throat: Alteration or loss of sense of taste and/or smell and, rarely, nasal septal perforation, nasal ulcer, sore throat, throat irritation and dryness, cough, hoarseness, and voice changes.

Eye: Dryness and irritation, conjunctivitis, blurred vision, glaucoma, increased intraocular pressure, and cataracts.

Cases of growth suppression have been reported for intranasal corticosteroids, including FLONASE (see PRECAUTIONS: Pediatric Use).

OVERDOSAGE

Chronic overdosage may result in signs/symptoms of hypercorticism (see PRECAUTIONS). Intranasal administration of 2 mg (10 times the recommended dose) of fluticasone propionate twice daily for 7 days to healthy human volunteers was well tolerated. Single oral doses up to 16 mg have been studied in human volunteers with no acute toxic effects reported. Repeat oral doses up to 80 mg daily for 10 days in volunteers and repeat oral doses up to 10 mg daily for 14 days in patients were well tolerated. Adverse reactions were of mild or moderate severity, and incidences were similar in active and placebo treatment groups. Acute overdosage with this dosage form is unlikely since 1 bottle of FLONASE Nasal Spray contains approximately 8 mg of fluticasone propionate.

The oral and subcutaneous median lethal doses in mice and rats were >1,000 mg/kg (>20,000 and >41,000 times, respectively, the maximum recommended daily intranasal dose in adults and >10,000 and >20,000 times, respectively, the maximum recommended daily intranasal dose in children on a mg/m² basis).

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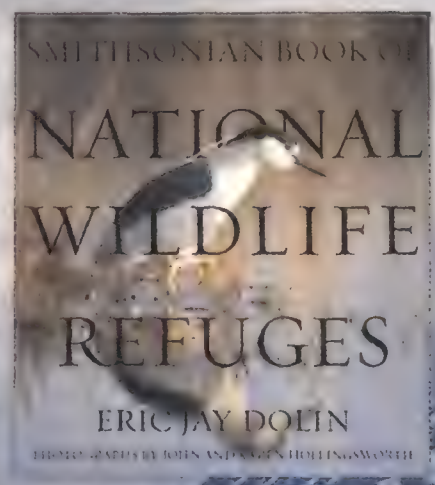
Smithsonian Book of National Wildlife Refuges



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WILBUR WAS ENCOURAGED. "The power is ample, and but for a trifling error due to lack of experience with this machine and this method of starting, the machine would undoubtedly have flown beautifully. There is now no question of final success."

quite in doubt as to whether the engine will be able to pull [the Flyer] at all with the present gears." The brothers estimated their odds of success at no more than even.

It grew colder. The sky turned winter white. After Chanute left the camp on November 12, the Wrights devised a new mechanical test. The results confirmed their own earlier predictions of the engine's efficiency, and they breathed easier. Orville wrote to Milton and Kate of Chanute's worries, but also wrote that "he nevertheless had more hope of our machine going than any of the others. He seems to think we are pursued by a blind fate from which we are unable to escape."

For Langley, it was now or never. After October's debacle, he told skeptical reporters that the crash was caused by a launching failure. Federal funds that had been set aside for the project were almost exhausted. On December 8, the aerodrome skimmed off the 60-foot track, over the choppy gray river and hit the air. "The enormous wings," wrote Tobin, "apparently could not withstand their sudden introduction to the forces of flight. They crumpled as soon as they were asked to fly." The aerodrome plunged into the water and descended into the soft mud at the bottom of the Potomac River.

"From the windows of the towering buildings, thousands forgot all else" as Wilbur's 20-mile flight over the Hudson captivated 1909 Manhattan.

It took the brothers less than a day to install the new shafts. But on the first day the machine was ready, December 12, the wind was too slack for a start from level ground—a requirement, they felt, for a true powered flight. They practiced running the machine along the track.

On Monday, December 14, the breeze blew at a listless five miles per hour, but they were impatient for action and decided to run the machine down a slope. They laid a 60-foot wooden launch rail. The aeroplane's skids would rest atop a small, one-wheeled truck that would roll down the rail at the urging of the engine and propellers. A man at either wingtip would keep the machine balanced as it rolled. If all went as planned, it would lift off the truck and fly.

Together the men trundled the machine up the sand hill on its creaky truck and maneuvered it into position on the rail. One of the brothers tossed a coin. Wilbur won the toss. He fit himself into the hip cradle, ducking under the chain that led from the engine, on the operator's right side, to the propeller shaft on his left. The machine began to roll before Orville, at the right wingtip, was ready to steady it properly. It raced downhill for 35 or 40 feet and lifted away from the rail, but the elevator was cocked at too sharp an angle, and the machine rose abruptly to 15 feet, stalled and thunked into the sand after only three seconds in the air, breaking a few parts. But Wilbur was encouraged. "The power is ample, and but for a trifling error due to lack of experience with this machine and this method of starting, the machine would undoubtedly have flown beautifully. There is now no question of final success."

REPAIRS TOOK A DAY AND A HALF. Late on the afternoon of December 16, with the machine finally ready for another try, the brothers felt the wind fade. They waited futilely on the beach, tinkering and still hopeful.

Overnight a northerly wind put a new skim of ice on puddles and ponds. In the morning the brothers bided their time for a couple of hours. Then, convinced the wind would stay strong for a bit, they went to work. It was so cold they had to run in and out of the shed to warm their hands.

The wind was blowing at about 25 mph, strong enough for a launch on level ground. The launching track was relaid to face north-northeast, directly into the wind. The machine was hauled into its starting position. To the south, the hump of the big hill loomed over their shoulders. Ahead, the ma-

HARPER'S WEEKLY

THE MEN AT THE LAUNCH RAIL realized Wilbur was not going to come back to the ground right away. The machine was leaving them far behind—200, 400, 600 feet, the noise of the engine fading, the wings on an even keel. He was flying.

In October, the 1903 Flyer moves to eye level at the National Air and Space Museum. It "literally changed the world," says director "Jack" Dailey.

chine faced a blank, barren plain. Now it was Orville's turn. The brothers padded through the sand around the machine, checking things. They cranked the engine and let it run for a few minutes. A camera was put in position, and the brothers asked John Daniels to pull the cord to the shutter if the machine got into the air.

At 10:35 Orville inched into the cradle. He released the rope. With Wilbur jogging alongside, his left hand on the right wingtip, the craft lumbered forward, reaching a speed of seven or eight mph.

Between the two spruce skids and the one-wheeled truck running along the rail, a space appeared. An inch became a foot, two feet, three feet. A long shadow ran across the sand. John Daniels squeezed a rubber bulb to open the camera's shutter (see p. 56 for the only photograph taken of the flight).

Wilbur, still jogging, saw the Flyer rise abruptly to a height of about ten feet, then dip just as suddenly, then rise again. Spread-eagled on the wing, Orville struggled to keep the elevator controls level. The craft dipped a second time, a wing tilted, and he was back on the ground, 120 feet from where he had left the launch rail.

A couple of parts were cracked, so an hour passed before Wilbur could take the next turn. He bettered Orville's distance by about 50 feet. Orville, on his second try, went a little farther still, and kept the machine steadier than on his first try. A gust came at him from the side, lifting the tip. When he twisted the wings to bring the tip back to level, he found the lateral controls strikingly responsive, much better than on the glider. But the forward rudder was too sensitive. The machine bobbed and dipped in an "exceedingly erratic" path.

At noon Wilbur tried again, and the bobbing and dipping continued. But somehow he found the proper angle for the forward rudder, and the men at the launch rail realized he was not going to come back to the ground right away. The machine was leaving them far behind—200, 400, 600 feet, the noise of the engine fading, the wings on an even keel.

He was flying.

The machine approached a hummock in the plain. Wilbur moved to adjust the forward rudder "and suddenly darted into the ground." He had gone 852 feet, a sixth of a mile, in 59 seconds. The rudder frame was cracked, but otherwise the machine was fine, as was the operator.

This fourth flight had been the most impressive, the fulfillment of the brothers' hope for sustained, powered flight. But they also realized that Orville's brief first try could also be described in words that applied to no previous effort by any experimenter. Orville himself, who took excruciating care in later years to express their history in precise terms, fashioned a description of what the first trial of the day had achieved. It was "a flight very modest compared with that of birds," he said, "but it was nevertheless the first in the history of the world in which a machine carrying a man had raised itself by its own power into the air in full flight, had sailed forward without reduction of speed, and had finally landed at a point as high as that from which it started."

That wasn't an exciting or inspiring way of saying that two human beings had learned how to fly. But it was the way the Wrights thought about things. Hyperbole about events of this day would come from others—although not for years. The magnitude of what they had done could be appreciated only by those who fully understood the steps they had taken and the problems they had solved through four years of work. That included the two of them and no one else in the world. They had flown, barely. They were utterly alone in their comprehension of all that that really meant. ○

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Fabricating Art

Laura Breitman fashions photo-realist collages out of whole cloth

~ BY ANN WILSON LLOYD

THE LARGE GLASS DOORS in Laura Breitman's Warwick, New York, studio frame views of dense woods and rock ledges soon to be covered with wild columbine. In winter, when the tangled branches are dusted with snow, the scene closely resembles one of Breitman's remarkable trompe l'oeil fabric collages.

Using fabric like paint, Breitman, 54, makes intricate, astonishingly realistic images based on old master paintings and photographs of landscapes, urban scenes and interiors. She is one of 120 American artists whose work will be on view at the Smithsonian Craft Show later this month in Washington, D.C.

"I've always loved fabric," she says. "I started with quilts and pillows, but after I took a class in collage, I wanted to see if I could re-create an image in detail in fabric. Originally I tried to set up a still life in my studio and work from that, but I couldn't find the point where I had left off each time. So I took a photograph of the

Breitman (left) rarely uses solid colors. "In real life," she says, "nothing is ever monochrome." *The Music Room* (above) is from 2002.

FABRIC ART LAURA BREITMAN; PORTRAIT ...O WESTENBERGER

"People often use the word tedious to describe my work," says Breitman, "but I find it meditative." *Soft Breeze* (left) and *Maple* (below) were both based on family photographs.

still life, and made a grid on it, blocking off everything but the square I was working on, and the collage came out looking just like the photo."

Breitman positions thousands of bits of cloth—from slivers to two-inch squares—onto her canvas, like so many overlapping brushstrokes. To get the variegated colors and graduated shades of light and dark just right, she often bleaches, dyes or block prints the fabric. Most of the time she uses flat-weave quilters' cotton, but she's been known to raid her closet for an elusive fragment. The wardrobe of her photographer husband, Michael Needleman, however, is usually safe. "Lucky for him, he wears a lot of flannel plaids," she says.

When a picture is complete, Breitman applies a matte varnish, which gives it a more uniform texture. Up close, the snippets of patterned cloth are visible; but from a distance, the pieces morph into photo-realist illusions.

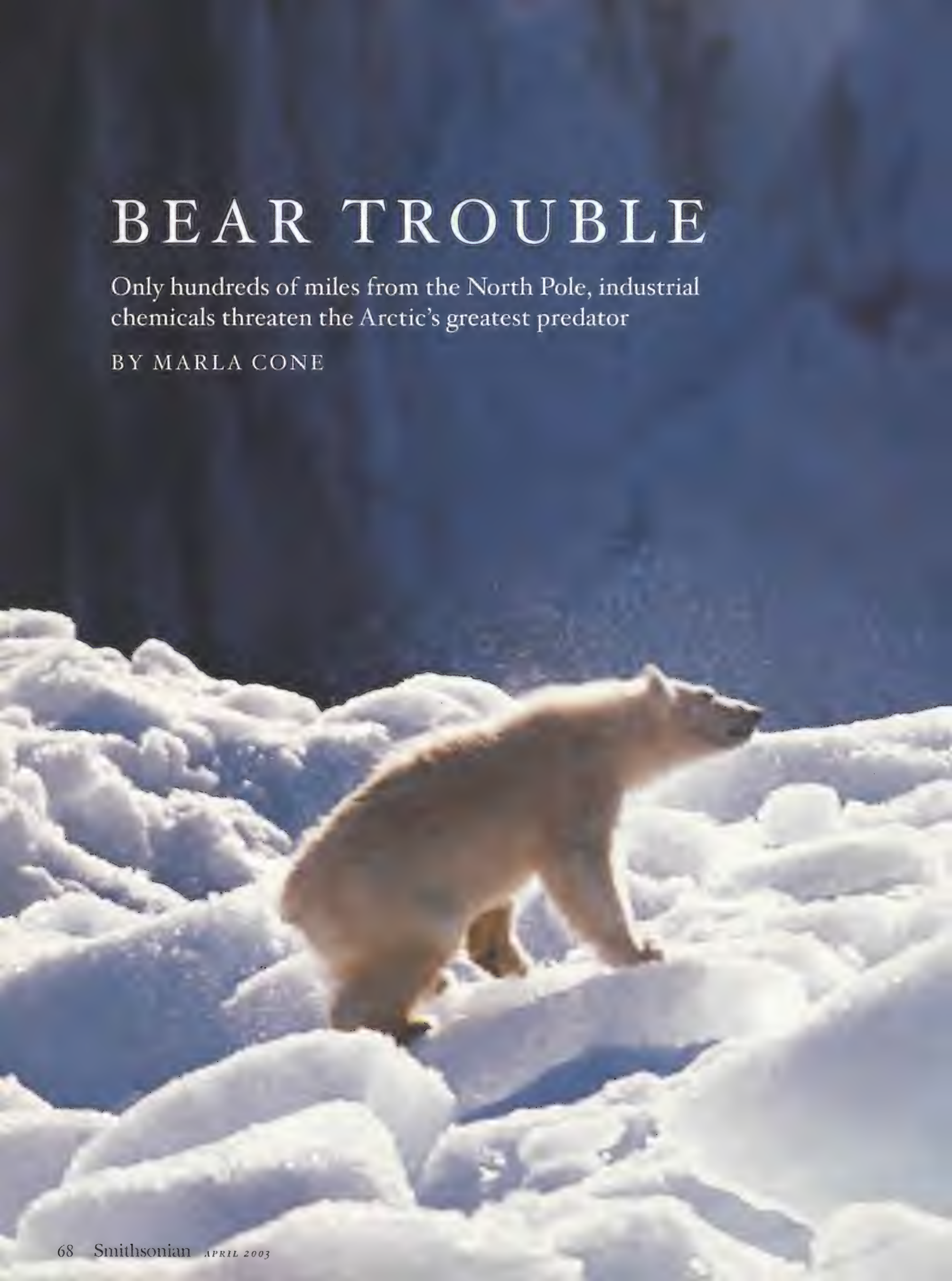
Breitman has been a textile designer in New York City's garment district, a welder in her family's Bronx ironworks, even a cabdriver and waitress. Along the way, she studied design, graphics, photography and children's book illustration. She draws special inspiration from artist Chuck Close, whose large portraits are highly realistic. "I worship him," she says. "His grid method, one square at a time . . . has a lot to do with what I do." She's also influenced by the eccentric works of unknown artists—a bouquet of flowers made of shells she once saw in a historic house, or a vintage Chinese painting created with butterfly wings she spotted on PBS's *Antiques Roadshow*. "What I do is closely related to those impulses," she says, "using unexpected materials not normally associated with the result . . . and fooling the eye." ○

THE 21ST ANNUAL SMITHSONIAN CRAFT SHOW will be held April 24-27 at the National Building Museum in Washington, D.C. For a preview of the show, go to: www.smithsoniancraftshow.org.

BEAR TROUBLE

Only hundreds of miles from the North Pole, industrial chemicals threaten the Arctic's greatest predator

BY MARLA CONE



CARVED BY HARSH WINDS and ancient glaciers and marked by jagged mountains and fjords, Svalbard, Norway, comprises a group of islands 650 miles inside the Arctic Circle, closer to the North Pole than to Oslo. One of the last true wildernesses, Svalbard is also one of the world's most important polar bear nurseries, though the place is so unforgiving that even under the best conditions many cubs die of starvation. Yet it is a man-made threat that

Having stopped a mother bear with a tranquilizer dart shot from the helicopter, Derocher (with Andersen, left, and Instanes, on Spitsbergen Island) tethers the cubs and takes tissue samples to gauge the mother's exposure to industrial chemicals like PCBs.

now imperils the bears. Despite living in remote reaches of the Arctic, Svalbard's bears carry higher doses of some industrial chemicals than nearly any other wild animal tested. And scientists increasingly suspect that the chemicals—especially polychlorinated biphenyl compounds, or PCBs—are harming the bears, perhaps jeopardizing their survival.

About 2,000 polar bears, perhaps 10 percent of the world's population, inhabit Svalbard, and in April, when spring arrives and the midnight sun returns, mother bears and cubs have stirred and left their winter dens. One of the more ominous findings of recent Svalbard research is that many cubs, even before they leave the safety of their dens to confront the elements, already harbor potentially harmful levels of PCBs, absorbed from their mother's milk.

Ice in the southernmost fjords begins to break up, revealing brilliant cobalt-blue seawater and great ice floes that look like giant white lily pads. Svalbard is desert dry, with 8 to 12 inches of precipitation a year. On overcast days in the northern reaches of Spitsbergen, the archipelago's largest island, the fjords are still iced over and it is hard to tell where the ice ends and the clouds begin. The ice looks as taut as a bedsheet in some spots, as billowy as a down comforter in others. This vast, silent plain is a favorite spot for polar bear mothers to raise their cubs.

From the front seat of a helicopter, Andy Derocher spots fresh tracks. Even 300 feet up, Derocher, a Canadian scientist with the Norwegian Polar Institute, in Tromsø, Norway, can tell the tracks were made by a mother and two new cubs. Pilot Oddvar Instanes flies side to side, back and forth, skillfully looping and straddling the tracks, trying to follow the erratic path of the bear family. Lounging by a hole in the ice, a seal looks up, as if puzzled by the helicopter's antics.

"She's running here," Derocher says, pointing to a row of bear tracks at the edge of a cliff. "I think she's ahead of us."

It is Derocher's seventh season tracking Svalbard's bears, monitoring their health and testing them for contaminants. He's one of the score of people on earth who know how to find and catch a polar bear. In nearly 20 years of research in Canada and Norway, he has captured perhaps 4,000. It is no easy thing, finding a polar bear on snow. Like ice, polar bear fur is translucent, and the hollow hair shafts reflect light. It is easier to spot a bear's tracks than to spot the bear.

Following the tracks, Derocher sees the mother and cubs right below the helicopter. In the chopper's backseat, Magnus Andersen, his Norwegian colleague, fills a syringe with tranquilizer—the same drug that veterinarians commonly use to anesthetize a dog or cat before operating on it. He injects the pale yellow liquid into a dart and screws it onto a modified shotgun. The pilot dips to about six feet over the mother, so close he can see the coarse hair on her back blowing in the wind. Andersen kneels on one leg and opens the door. A freezing blast of air slaps him in the face. The blades whip up

MARLA CONE is featured in the Editor's Note, page 9.

MARLA CONE; PP. 68, 69 RALPH LEE HOPKINS

a frenetic whirlwind of snow, masking his view. Andersen, attached by only a thin green climbing rope, hangs out the open door. He takes aim and fires. The smell of gunpowder fills the cabin. "OK," Andersen says. A dart sticks out of the bear's rump. Precision is important. If he had hit her in the chest, he would have killed her.

Within minutes, the mother is starting to wobble. After another few minutes, she lies down on her stomach, panting heavily, eyes open but still, one giant paw splayed back. The cubs nuzzle her, trying to waken her, then settle down beside her. They are wide-eyed and curious as the helicopter lands and Derocher and Andersen cautiously approach on foot, their boots crunching in the crusty snow. The two men circle the bears slowly.

Derocher is a big man, 6-foot-3 and 225 pounds, but the mother bear is twice his weight. A male bear can weigh nearly a ton. Derocher knows polar bears well enough to fear them, and he and Andersen always wear loaded .44 Magnum pistols holstered on their waists. A few years earlier, two young tourists were mauled to death by a bear outside Longyearbyen, Svalbard's largest settlement (pop. 1,600). Now, as soon as visitors set foot in Svalbard, they are handed a pamphlet with a photograph of two bears ripping apart a carcass—seal, presumably. The animal's entrails are exposed in a bloody pulp, and the pamphlet warns in bold red letters: "TAKE THE POLAR BEAR DANGER SERIOUSLY!" Derocher never forgets that advice. He doesn't like being on the bear's turf, so he watches his back. "It's never the bear we're dragging that's dangerous," he says in a Canuck accent that sounds a bit Irish in its rustic lilt. "It's always the bear you *don't* see."

The cubs, which are about 4 months old, are as adorable and innocent as their mother is deadly. At 45 pounds apiece, they are about the size of Derocher's 6-year-old daughter and just as harmless. Gloveless, Derocher strokes the soft fur on one, and Andersen holds out a finger for the other to sniff and lick. They are the first human beings these cubs have seen, and may be the last. Andersen gently loops ropes around their necks and tethers them to their mother to keep them from bolting. Without her, they would die.

Andersen checks the mother's ear for an identifying tag. "She was caught once before," he says.

"When?" Derocher asks.

"1994."

Derocher sets down his black toolbox, takes out some dental pliers and opens the bear's jaw. Leaning inside her gaping mouth, he deftly extracts a tooth the size of a cribbage peg. The scientists will use the tooth, a premolar that the bear does not need, to confirm her age. She is around 15 years old, Derocher estimates, and he says he wonders if this will be her last set of cubs. Older mother bears—over 15 years—are rare in Svalbard. Derocher suspects that chemical contaminants are to blame. (Female polar bears in the wild can live as long as 28 years or so.)

Andersen is working on her other end, using a biopsy tool to cut a quarter-inch diameter plug of flesh from her rump. Then he quickly fills a test tube with blood from a vein in one of her hind legs. A lab will analyze the bear's fat and blood for the presence of numerous chemicals. The two scientists stretch a rope over the mother to measure her girth and length, which they then use to calculate her weight.

No matter how cold it gets, Derocher and Andersen always work with bare hands. Today is warm for Svalbard, right at the freezing mark. A few days before, they worked in minus 2 degrees Fahrenheit. They record their data with pencils because ink freezes. Every April, Derocher leaves his family for a month to work in this icy realm. He says his heroes are the 19th-century polar explorers who set out on uncharted ice, surviving years at a time with few provisions. There's a touch of adventure to his vocation, but Derocher dismisses any comparison to explorers of old. In fact, he says, he hates the cold. "I don't think I would last a month out here," he says. "Not unless I had my Goretex and fleece and high-powered rifle."

Before evaluating the cubs and taking blood samples, Derocher and Andersen inject them with tranquilizer. Derocher attaches an identifying tag to an ear on each cub. Drops of blood fall onto the snow. Derocher goes back to the mother, gently lifts her massive head and puts her lolling tongue back in her mouth. Instanes, the pilot, uses brown hair dye to paint a large X on her rump, signaling that she shouldn't be bothered again this year. The cubs are snoring now, all eight paws splayed out on the snow. The threesome will sleep for about two hours, then awaken, shake off the drowsiness and continue on their way. Andersen and Derocher pack up their toolbox and walk silently back to the helicopter. It has been 40 minutes since they landed.

Capturing polar bears for research can be dangerous for man and bear, but the scientists say it's critical to understand how the animals are faring, how often they give birth, whether the cubs survive, how many industrial pollutants they carry in their bodies. Otherwise, the polar bear "would blindly stumble into extinction," Derocher says, adding: "My job is to make sure polar bears are around for the long term."

When bad weather sets in, or the

MIKE REAGAN

Few researchers have studied more wild polar bears than Derocher (left, extracting a tranquilized bear's premolar tooth), who has captured nearly 4,000 over 20 years. Right: Derocher and Andersen weigh a cub they've sedated.

helicopter breaks down, Derocher and his team can be stranded on the ice. Or worse. On a spring day in 2000, two Canadian colleagues tracking bears were killed when their helicopter crashed during a whiteout, a condition in which heavy clouds and snow obscure the ground. If a whiteout descends on Derocher and his crew, they throw dark-colored, rock-filled garbage bags out the helicopter window to determine which way is up.

The helicopter lifts off, heading north. Within ten minutes, Derocher has spotted more tracks—this time, a mother and two plump yearlings. Andersen fills another syringe and rests the shotgun on his leg.

DEROCHER, whose towering height, jet-black hair and full beard give him the aura of a big bear himself, is guided by an internal compass that steers him north, far north, whenever he craves serenity. He was raised along the lush banks of British Columbia's Fraser River, where he collected bird eggs and garter snakes and fished for salmon fry. He studied forest biology at the University of British Columbia and earned his doctorate in zoology at the University of Alberta. When he ventured into the Canadian Arctic for the first time as a young researcher, it struck him as barren. Then, his mentor, Ian Stirling, a polar bear expert at the Canadian Wildlife Service, dropped a hydrophone into the sea. Derocher listened to whales singing, seals grunting, ice grinding. When he heard that undersea symphony and also saw bloodstains on the ice left by feasting polar bears, he realized the place was far from being a sterile wasteland and was hooked.

The Arctic "is the end of civilization," he says. "Far off on the ice, there is an immense sense of peace and remoteness that you can't find in many places in the world anymore."

Since the early 1980s, he had dreamed of studying polar bears in their purest form, of finding a pristine population, and when he first set foot in Svalbard, in 1996, he thought he had found polar paradise. The animals had not been hunted or trapped since 1973, so their population should have been booming. But something was amiss. "Things just don't appear right," he told colleagues within a year of arriving.

It was as if the bears were still being hunted. Where were the older bears? Why were there so few of them? Why wasn't the population growing more quickly? A lot of cubs, he found, didn't make it. Were they more prone to die than cubs in North America? And then Derocher came across strange, pseudo-hermaphroditic female bears with both a vagina and a small penis-like appendage. "Within the first year, it became pretty darned clear that I wasn't working with an unperturbed population," he says.

He began to think the reason might be chemical contaminants. Other scientists had been gathering evidence that although the world of the polar bear is as white as the driven snow, it's not pure after all. Derocher has found the highest PCB levels in Svalbard's male bears, with as much as 80 parts of the chemical per million parts of body tissue. (Researchers

ANDREW DEROCHER; MARLA CONE; P. 72 MALIE RICH-GRIFFITH

have not established a precise toxic threshold for PCBs in polar bears.) On average, male bears in Svalbard carry 12 times more of the chemical contaminant in their bodies than do male bears in Alaska. In living wild mammals, higher PCB levels have been found only in Pacific Northwest orcas, Baltic seals and St. Lawrence River beluga whales. Svalbard's bears carry "alarmingly high" concentrations of PCBs, says Janneche Utne Skaare, of Norway's National Veterinary Institute, who conducts polar bear contaminants research.

The snow is clean. The air is clean. Even the water is clean. So where is this toxic trash coming from? Though PCBs were banned in the late 1970s in most of the world, the compounds, once widely used as insulating and cooling fluids in electrical equipment, are remarkably persistent. In a way, climate and geology conspire to transport PCBs to the Arctic, which in the view of some scientists, is becoming a sort of giant pollution sink. Prevailing winds sweep air pollution from eastern North America, Europe and Russia northward. Svalbard in particular is something of a crossroads, buffeted by three seas and the Arctic Ocean. In a phenomenon that scientists call the grasshopper effect, PCBs from, say, a discarded transformer on the Eastern Seaboard can repeatedly evaporate in warm weather, ride the wind and fall to the ground until they've hopscotched to the Arctic, where they land on snowfields and in frigid seas and are trapped. The chemicals work their way up the marine food chain, step-by-step. From water to plankton to crustaceans to cod to ringed seals to polar bears—with each link, PCBs can become 10 to 20 times more concentrated. Predators at the top of the chain thus take in the highest dosages. A polar bear can carry a million times the concentration of PCBs detected in seawater. And a mother that harbors contaminants in her fatty tissue passes them on to her suckling newborn. When newborn cubs feast on their mother's milk, they feast upon her past.

Norwegian and Canadian scientists have recently linked a variety of effects in the bears to PCBs, including alterations in immune cells, antibodies, retinol, thyroid hormones, testosterone and progesterone. The scientists don't know what these biological changes mean to the health of individual bears or the whole population. But they have recently amassed disturbing signs of trouble.

Scientists testing bears in Canada have found that concentrations of PCBs were three times higher in denning mothers that wound up losing their cubs than in mothers whose cubs survived. Skaare speculates that pollutants are taking a toll on Svalbard's bears, too; they seem to den more often than other bears, about every two years instead of every three, which suggests that an unusual number of cubs are not surviving.

Evidence is also mounting that PCBs are suppressing the

Even in the Arctic, bears ingest industrial chemicals. Pollutants borne by the wind or ocean can be concentrated in the food chain—absorbed by plankton and then consumed by fish, marine mammals (like the seal, below) and ultimately the top predators.

bears' immunity to disease. The ability to rapidly produce large volumes of antibodies against viruses and infections is critical for survival. But polar bears with high amounts of PCBs can't muster up many antibodies, and levels of the immune cells called lymphocytes are suppressed, according to Derocher and other researchers. Bears in Canada, which carry far less PCBs, produce more antibodies than Svalbard bears. Hinting at the capacity of PCBs to weaken the immune system with disastrous effects, a distemper virus wiped out some 20,000 PCB-laden seals in Europe in 1988.

Derocher has also documented altered levels of testosterone in male bears and progesterone in female bears, and he suspects that PCBs may be the reason for the disrupted reproductive hormones. He's trying to determine whether PCB-carrying bears are also less fertile than other bears and whether the contaminants account for Svalbard's pseudohermaphroditic bears. (Out of every 100 female bears captured, 3 or 4 also have the genital abnormality.) PCBs also seem to deplete the bears' reserves of retinol, or vitamin A, which is critical for regulating growth.

Some scientists say that the polar bear population is lower than expected, and they wonder if PCBs are to blame for what they describe as a missing generation. Contaminant levels in Svalbard bears peaked in the late 1970s through the early '90s. And studies showed that the bears had seven times more of some PCBs in their bodies in the early 1990s than in 1967. At the same time, researchers have found a dearth of bears born in Svalbard when pollution levels peaked. In one study, only 13 percent of Svalbard bears with cubs were over 15 years old, compared with 40 percent in Canada. Geir Wing Gabrielsen, director of ecotoxicology research at the Norwegian Polar Institute, says it is obvious that Svalbard bears have been weakened. "Everything indicates that the polar bear is being affected by these contaminants," he said. "There are so many indications that there are population effects."

Yet scientists remain cautious. Peter S. Ross of Canada's Institute of Ocean Sciences, in Sidney, who is an authority on the effects of PCBs on marine mammals, says the evidence does not necessarily establish that the contaminants have caused the bears' problems. Wild animals face so many natural and man-made challenges that it's almost impossible to tease out one factor as the root problem. But Ross acknowledges that PCBs (and other pollutants) correlate with changes in animal physiology and have the potential to do harm.

Ross Norstrom, an environmental chemist at the Canadian Wildlife Service, worries most about the cubs. Perhaps cubs are dying from contamination, or perhaps the effect is more subtle, like altered hormones, Norstrom says. Weighing barely a pound at birth, a polar bear cub in Svalbard is hit with a blast of PCBs from its mother's milk right when its immune and reproductive systems are developing. Norstrom believes that now, a quarter-century after PCBs were banned in most of the world, scientists are finally on the cusp of determining exactly what sorts of harm, if any, the chemicals have inflicted on the Arctic. The overall health of Svalbard's bears is "at best unknown," says Derocher, largely because of the difficulties of observing them in the wild.

JUST BEFORE 9 P.M. in late April, Derocher and the Norwegian Polar Institute crew are done for the day, and Instanes pilots the helicopter back to town. To the north, the clouds are closing in, threatening a whiteout, but the way south is crystal clear.

The landscape looks almost voluptuous. Curvaceous peaks are bathed in soft light, awash in hues of icy blue and frosty white. Svalbard seems almost welcoming, as if it could enfold the team in a warm embrace. The three men are glowing with the satisfaction—and relief—of knowing they are headed back to camp in Longyearbyen for a hot dinner and warm bed after a long day. They captured six bears on a tank of fuel, and all are safe, men and bears.

Derocher peers out the chopper window. "Boy, it's pretty when the light is like this," he says. The pilot nods.

Derocher doesn't mention it, but this is his last foray into Svalbard. He will soon head home to Canada to conduct research on polar bears in Canada for his alma mater, the University of Alberta. Seven years in Svalbard were not enough to definitively answer the question of the bears' future. But then, this is a place of mystery, where compasses don't work, where summer nights look like day and winter days look like night, where sometimes you cannot even tell up from down. But Derocher has learned enough to fear for the bears; he believes that a legacy of man-made pollution promises to haunt the Arctic—frozen in time, slow to heal—for generations to come.

Cubs raised on pollution-laced mother's milk, says Derocher (with a 5-month-old in Svalbard) may be prone to disease and early death.

ANDREW DEROCHER

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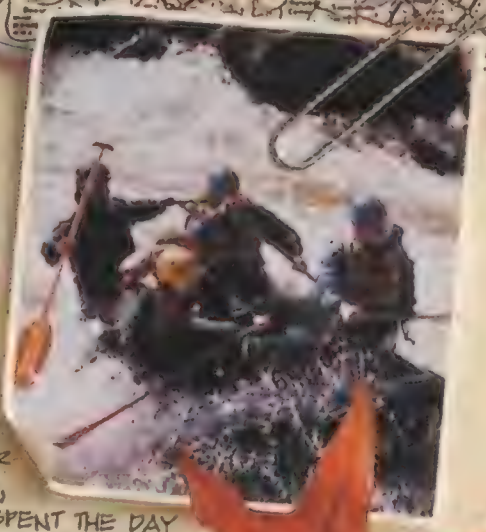

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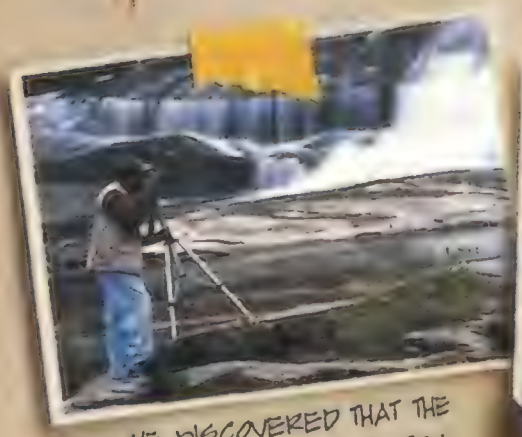

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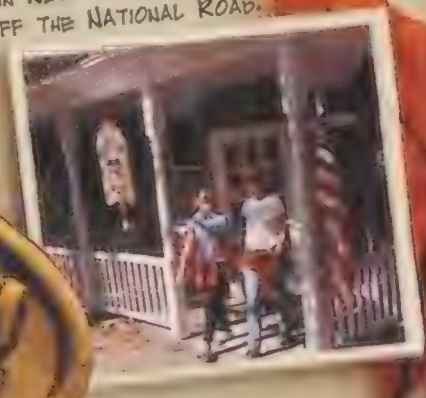

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MR. LINCOLN'S WASHINGTON

The house where the conspirators hatched their heinous plot now serves sushi, and the yard where they were hanged is a tennis court. But much of the slain 16th president's capital remains surprisingly intact – BY CHRISTOPHER BUCKLEY

Washington, D.C. is chockablock with historians, but perhaps none so jaunty as satirist Christopher Buckley, who says that Congress in 1783 debated a "bill requiring air bags and rear brake lights on stagecoaches." Buckley, a Washington resident since 1981, has spent years making sport of politics; his first novel, The White House Mess *(1986), gave us the feckless President Thomas N. Tucker, or TNT, who declared war on Bermuda, and Buckley's most recent,* No Way to Treat a First Lady *(2002), posits a chief executive done in by overexertions in the Lincoln Bedroom. In* Washington Schlepped Here, *published this month, Buckley makes his usual merry, but also shows a thoughtful fondness for what he calls this "Rome-on-the-Potomac landscape of gleaming white granite and marble buildings squatting on a vast green lawn." He bases his book on four walking tours, along the way tossing off facts (the spot where Francis Scott Key's son was fatally shot) and lore (a ghost is said to haunt the Old Executive Office Building). "Washington is a great city to walk around in," Buckley says. "For one thing, it's pretty flat. For another, something wonderfully historic happened every square foot of the way." In the excerpt that follows, Buckley covers the Washington of Abraham Lincoln:*

ON THE 137TH ANNIVERSARY of the day Mr. Lincoln was shot, I joined a tour in Lafayette Square, on Pennsylvania Avenue across from the White House, conducted by Anthony Pitch, a spry man wearing a floppy hat and carrying a Mini-Vox loudspeaker. Pitch is a former British subject, and the author of a fine book, *The Burning of Washington,* about the British torching of the city on August 24, 1814. Pitch once saw, in the basement of the White House, the scorch marks left over from the incident. But for a thunderstorm that must have seemed heaven-sent, many of the city's public buildings might have burned to the ground. It's often said the presidential residence was first painted to cover up the charred exterior, but official White House historians say that isn't so, and point out that the building of pinkish sandstone was first whitewashed in 1798 and was known informally as the White House before the British ever set it aflame. Theodore Roosevelt made the name official in 1901 when he put "The White House" on the stationery.

But Pitch's theme today is Abraham Lincoln, and his enthusiasm for the man is little short of idolatrous. "He was one of the most amazing people who ever walked the earth,"

BETTMANN / CORBIS; CORBIS

From a second-floor window of the White House (above, in 1863), Lincoln spoke on April 11, 1865, to a crowd that included Booth.

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FORD'S THEATRE. *Draped in funereal crepe after Lincoln was assassinated there (above, left in 1865), it is back in use today (right).*

says Pitch. "He was self-taught and never took umbrage at insults. That such a man was shot, in the back of the head, is one of the most *monstrous insults that ever happened.*" I liked Pitch right away.

We crossed the street and peered through the White House fence at the North Portico. He pointed out the center window on the second floor. (You can see it on a twenty dollar bill.) On April 11, 1865, he told us, Abraham Lincoln appeared there and gave a speech. "It was the first time he had said in public that blacks should get the vote," Pitch explained. A 26-year-old actor named John Wilkes Booth was in the crowd outside, along with a man named Lewis Paine (born Powell). Booth had been stalking Lincoln for weeks. Booth growled, "That means nigger citizenship. That is the last speech he will ever make. . . . By God, I'll put him through."

Another man in the crowd that day was a 23-year-old physician, Charles Leale, who would be the first to care for the mortally wounded president. Pitch pointed out another window, three over to the right. "That room was called the Prince of Wales Room. That's where they did the autopsy and the embalming."

"One of the most amazing people to walk the earth," Pitch says of Lincoln.

MY MIND WENT BACK 20 years, to when I was a speechwriter for then Vice President George H.W. Bush, to a night I had dinner in that room, seated at a small table with President Reagan and two authentic royal princesses, both of them daughters of American actresses (Rita Hayworth and Grace Kelly). I mention this not to make you think, Well whupty-do for you, Mr. Snooty. Let me emphasize: 99.98 percent of my dinners in those days took place at a Hamburger Hamlet or McDonald's or over my kitchen sink. But at one point in this heady meal, President Reagan turned to one of the princesses and remarked that his cavalier King Charles spaniel, Rex, would begin barking furiously whenever he came into this room. There was no explaining it, Reagan said. Then he told about Lincoln and suddenly the president of the United States and the two princesses began swapping ghost stories and I was left openmouthed and a voice seemed to whisper in my ear, *I don't think we're in Kansas anymore, Toto.*

For two years, I had a White House pass that allowed me everywhere except, of course, the second-floor residence. One time, hearing that Jimmy Cagney was about to get the Medal of Freedom in the East Room—where Abigail Adams hung out her wash to dry, Lincoln's body lay in state, and I once sat behind *Dynasty* star Joan Collins while she and husband number four (I think it was) necked as Andy Williams crooned "Moon River"—I rushed over from the Old Executive Office Building just in time to see President Reagan pin it on the man who had tap-danced "Yankee Doodle Dandy" and was now a crumpled, speechless figure in a wheelchair. I remember Reagan putting his hand on Cagney's shoulder and saying how generous he had been "many years ago to a young contract player on the Warner Brothers lot."

During the administration of George H. W. Bush, I was in the State Dining Room for a talk about Lincoln's time at the White House by professor David Herbert Donald, author of the much-praised biography *Lincoln*. I sat directly behind Colin Powell, then chairman of the Joint Chiefs of Staff, and remember that for an hour General Powell did not move as

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10TH STREET. *Booth fled via an alley (above, then and now) behind Ford's; Lincoln died in a house across the street (above).*

1. The White House
2. Lafayette Square
3. Surratt Boardinghouse
4. Ford's Theatre
5. Petersen House
6. Arsenal Penitentiary (now Fort McNair)
7. Lincoln Memorial
8. National Museum of American History

Red pins mark sites existing in Lincoln's day; yellow, later additions.

much as a centimeter. What I also remember of the evening was Professor Donald's stories about Mary Todd Lincoln's extravagances. Mrs. Lincoln was the Imelda Marcos of her day. This woman *shopped*. Among her purchases was the enormous rosewood bed that became known as the Lincoln Bed, even though her husband never spent a night in it. (The Lincoln Bedroom would become notorious during the Clinton years as a sort of motel for big donors to the Democratic Party.) At any rate, by 1864, Mary Todd Lincoln had run up a monumental bill. While field commanders were shouting "Charge!" Mrs. Lincoln had been saying "Charge it!"

Professor Donald ended his riveting talk by looking rather wistfully at the front door. He said that Mrs. Lincoln hadn't wanted to go to the theater that night. But the newspapers had advertised that Lincoln would attend the performance of *Our American Cousin*, and the president felt obliged to those who expected to see him there. In his wonderful book, *April 1865*, Jay Winik writes that Abe said he wanted to relax and "have a laugh." Never has a decision to go to the theater been so consequential.

"And so," said Professor Donald, "they left the White House together for the last time."

WE'RE STANDING in Lafayette Square in front of a redbrick building, 712 Jackson Place. The plaque notes that it's the President's Commission on White House Fellowships, the one-year government internship program. But in April 1865 it was the residence of a young Army major named Henry Rathbone, who was engaged to his stepsister Clara, daughter of a New York senator.

As Professor Donald recounts in his biography, April 14, 1865, was Good Friday, not a big night to go out, traditionally. It's hard to imagine today, when an invitation from the president of the United States is tantamount to a subpoena, but the Lincolns had a hard time finding anyone to join them at the theater that night. His own secretary of war, Edwin Stanton, declined. (Mrs. Stanton couldn't stand Mrs. Lincoln.) General Grant also begged off. (Mrs. Grant couldn't stand Mrs. Lincoln.) Lincoln was subsequently turned down by a governor, another general, the Detroit postmaster(!), another governor (Idaho Territory) and the chief of the telegraph bureau at the War Department, an Army major named Thomas Eckert. Finally Abe turned to another Army major, Henry Rathbone, who said to the president, in so many words, OK, OK, whatever. The image of the president pleading with an Army major to sit in the president's box is the final tragicomic vignette we have of Lincoln. It's of a piece with his humanity and humility.

After Booth shot Lincoln, Rathbone lunged for Booth. Booth sank a viciously sharp seven-inch blade into his arm, opening a wound from elbow to shoulder. Rathbone survived, but the emotional wound went deeper. One day 18 years later, as U.S. Consul General in Hanover, Germany, he shot his wife dead. Rathbone himself died in 1911 in an asylum for the criminally insane. "He was one of the many people," Pitch said, "whose lives were broken that night."

I HAD LAST BEEN to Ford's Theatre on my second date with the beautiful CIA officer who eventually, if unwisely, agreed to marry me. The play was a comedy, but even as I chuckled, I kept looking up at Lincoln's box. I don't know how any actor can manage to get through a play here. Talk about negative energy. And it didn't stop with the dreadful night of April 14, 1865. Ford's later became a government office building, and one day in 1893, all three floors collapsed, killing 22 people.

You can walk up the narrow passageway to the box and see with your own eyes what Booth saw. It's an impressive leap he made after shooting Lincoln—almost 12 feet—but he caught the spur of his boot on the flags draped over the president's box and broke his leg when he hit the stage. Donald quotes a witness who described Booth's motion across the stage as "like the hopping of a bull frog."

In the basement of Ford's is a museum (due to reopen this spring after renovations) with artifacts such as Booth's .44 caliber single-shot Deringer pistol; a knife that curators believe is the one that Booth plunged into Rathbone's arm; the Brooks Brothers coat made for Lincoln's second inaugural, the left sleeve torn away by relic-hunters; the boots, size 14, Lincoln wore that night; and a small bloodstained towel.

THE PLAN. *"The nest where the egg was hatched," President Andrew Johnson said of Surratt's boardinghouse (top, then; bottom, now).*

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THE PLAYERS. *From left to right: Secretary of War Stanton, who took charge of Lincoln's vigil; Dr. Leale, the first to treat the mortally wounded president; Secretary of State Seward, knifed by Paine, a coconspirator; Paine; Surratt, a Confederate sympathizer whose son had plotted to kidnap Lincoln; Dr. Mudd, who received a life sentence (and was pardoned four years later) for setting Booth's broken leg.*

Members of a New York cavalry unit tracked down Booth 12 days later and shot him to death. Four of Booth's coconspirators, including Mary Surratt, proprietress of the boardinghouse where they plotted the assassination, were hanged on July 7. (The military tribunal that presided over their trial requested a lighter sentence for Surratt, but the request went unheeded.) Also displayed are the manacles the conspirators wore in prison awaiting their execution. Here, too, are replicas of the white canvas hoods they wore to prevent them from communicating with each other. Inevitably, one thinks of the Washington heat. Beneath a hood is a letter from Brevet Maj. Gen. John F. Hartranft, commandant of the military prison, dated June 6, 1865: "The prisoners are suffering very much from the padded hoods and I would respectfully request that they be removed from all the prisoners, except 195." That was Lewis Paine, who at about the same time Booth shot Lincoln attacked Secretary of State William Seward at his home on Lafayette Square, stabbing him in the throat and face. There's a photograph of Paine in manacles, staring coldly and remorselessly at the photographer. Perhaps it was this stare that persuaded Major General Hartranft that the hood was best left on.

We left Ford's Theatre and crossed the street to The House Where Lincoln Died, now run by the National Park Service. I had been here as a child, and remembered with a child's ghoulish but innocent fascination the blood-drenched pillow. It is gone now. I asked a ranger what happened to it. "It's been removed to a secure location," she said. Secure location? I thought of the final scene in the movie *Raiders of the Lost Ark*, as the ark is being wheeled away to be stored amid a zillion other boxes in a vast government warehouse. She added, "It was deteriorating." OK, I thought, but better not tell me where it is, I might steal it.

The air inside the house is close and musty. A little sign on a table says simply, "President Lincoln died in this room at 7:22 a.m. on April 15, 1865." Lincoln was 6-foot-4. They had to lay him down on the bed diagonally, with his knees slightly bent. He lived for nine hours.

I went back outside. Pitch was telling the story of Leale, the young Army surgeon. The first doctor to reach the Ford's theater box, Leale knew right away the wound was mortal. He removed the clot that had formed, to relieve pressure on the president's brain. Leale said the ride back to the White House would surely kill him, so Leale, two other physicians and several soldiers carried him across the street, to the house of William Petersen, a tailor. According to historian Shelby Foote, Mrs. Lincoln was escorted from the room after she shrieked when she saw Lincoln's face twitch and an injured eye bulge from its socket.

Secretary of War Stanton arrived and set up in the adjoining parlor and took statements from witnesses. A man named James Tanner, who was in the crowd outside, volunteered to take notes in shorthand. Tanner had lost both legs at the Second Battle of Manassas in 1862 but, wanting to go on contributing to the war effort, had taken up stenography. He worked through the night. Later he recalled: "In fifteen minutes I had enough down to hang John Wilkes Booth."

Mrs. Lincoln, having returned to the bedside, kept wailing, "Is he dead? Oh, is he dead?" She shrieked and fainted after the unconscious Lincoln released a loud exhalation when she was by his face. Stanton shouted, "Take that woman out and do not let her in again!"

Leale, who had seen many gunshot wounds, knew that a man sometimes regained consciousness just before dying. He held the president's hand. Lincoln never regained consciousness. When it was over, Stanton said, "Now he belongs to the ages."

Mrs. Surratt's boardinghouse, where the conspirators hatched their plot, is not far away, near the corner of H and 6th Streets. It's now a Chinese-Japanese restaurant called Wok and Roll.

IT'S ONLY A FEW BLOCKS from The House Where Lincoln Died to the Smithsonian National Museum of American History. There you'll find a plaster cast of Lincoln's hands made in 1860, after he won his party's nomination. A caption

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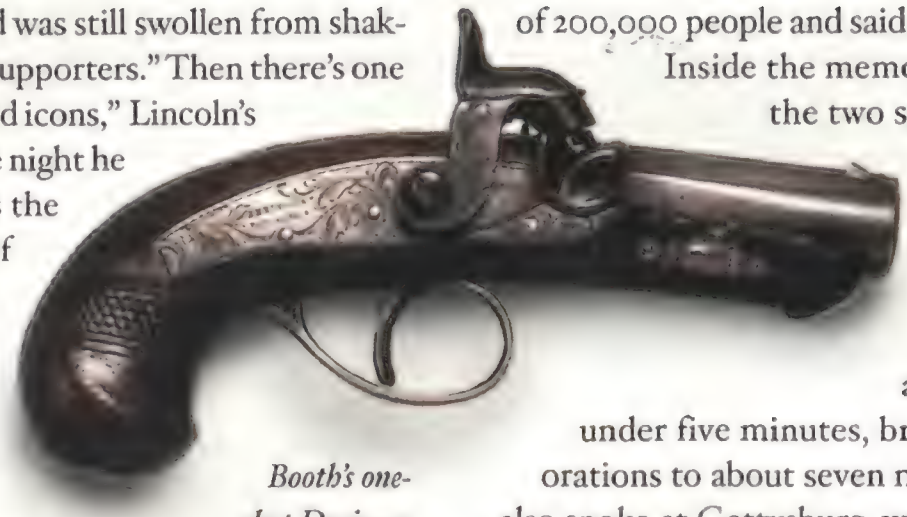
notes that "Lincoln's right hand was still swollen from shaking hands with congratulating supporters." Then there's one of the museum's "most treasured icons," Lincoln's top hat, worn to the theater the night he was assassinated. Here, too, is the bloodstained sleeve cuff of Laura Keene, star of *Our American Cousin*, who, according to legend, cradled Lincoln's head after he was shot.



Booth's one-shot Deringer

No tour of Lincoln's Washington would be complete without his memorial, on the Potomac River about a mile west of the museum. Finished in 1922, it was built over a filled-in swamp, in an area so desolate that it seemed an insult to put it there. In the early 1900s, the speaker of the House, "Uncle Joe" Cannon, harrumphed, "I'll never let a memorial to Abraham Lincoln be erected in that God-damned swamp." There is something reassuring about thwarted congressional asseverations.

Lincoln's son, Robert Todd Lincoln, who had witnessed Lee's surrender to Grant at Appomattox on April 9, 1865, and was at his father's side when he died six days later, attended the memorial's dedication. Robert was then 78, distinguished-looking in spectacles and white whiskers. You can see from a photograph of the occasion that he had his father's large, signature ears. (Robert, who had served as ambassador to Great Britain and was a successful businessman, died in 1926.)

Also present at the memorial's dedication was Dr. Robert Moton, president of the Tuskegee Institute, who delivered a commemorative speech but still was required to sit in the "Colored" section of the segregated audience. It's good to reflect that the wretched karma of this insult to the memory of Abraham Lincoln was finally exorcised 41 years later when Dr. Martin Luther King, Jr., stood on the memorial steps in front of 200,000 people and said, "I have a dream."

Inside the memorial, graven on the walls, are the two speeches in American history that surpass Dr. King's: the Gettysburg Address and the Second Inaugural. I read the latter aloud to myself, quietly, so as not to alarm anyone. It clocks in at under five minutes, bringing the total of those two orations to about seven minutes. Edward Everett, who also spoke at Gettysburg, wrote Lincoln afterward to say, "I should flatter myself if I could come to the heart of the occasion in two hours in what you did in two minutes."

Daniel Chester French, who sculpted the statue of Lincoln that stares out on the Reflecting Pool, studied a cast of Lincoln's life mask. You can see a cast in the basement of the memorial, and it is hard to look upon the noble serenity of that plaster without being moved. Embarking from Springfield, Illinois, in 1861 to begin his first term as president, Lincoln said, "I now leave, not knowing when, or whether ever, I may return, with a task before me greater than that which rested upon Washington." When I first read that speech as a schoolboy, I thought the line sounded immodest. Harder than what Washington faced? Come on! Only years later when I saw again the look on Lincoln's face that French had captured did I understand.

French knew Edward Miner Gallaudet, founder of Gallaudet University in Washington, the nation's first institution of higher learning for deaf people. Lincoln signed the bill that chartered the college. Look at the statue. Lincoln's left hand seems to spell out in American Sign Language the letter *A*, and his right hand, the letter *L*. Authorities on the sculptor say French intended no such thing. But even if it's just a legend, it's another way Lincoln speaks to us today. ○

PICTURE HISTORY; LIBRARY OF CONGRESS; REGIS LEFEBURE.

THE SENTENCE. *Surratt, David Herold, George Atzerodt and Paine were hanged (left) on the grounds of present-day Fort McNair.*

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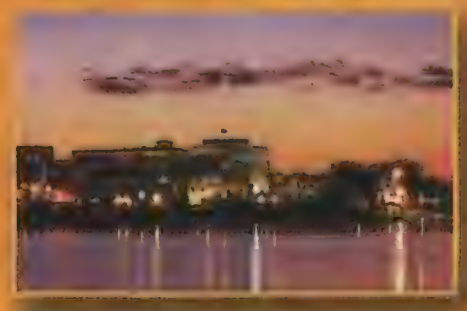

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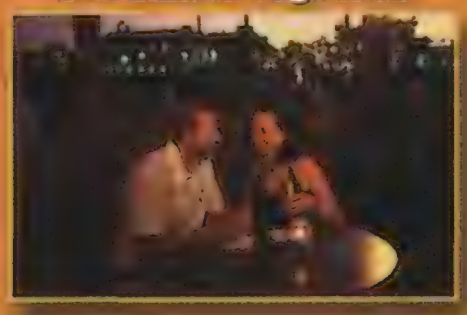

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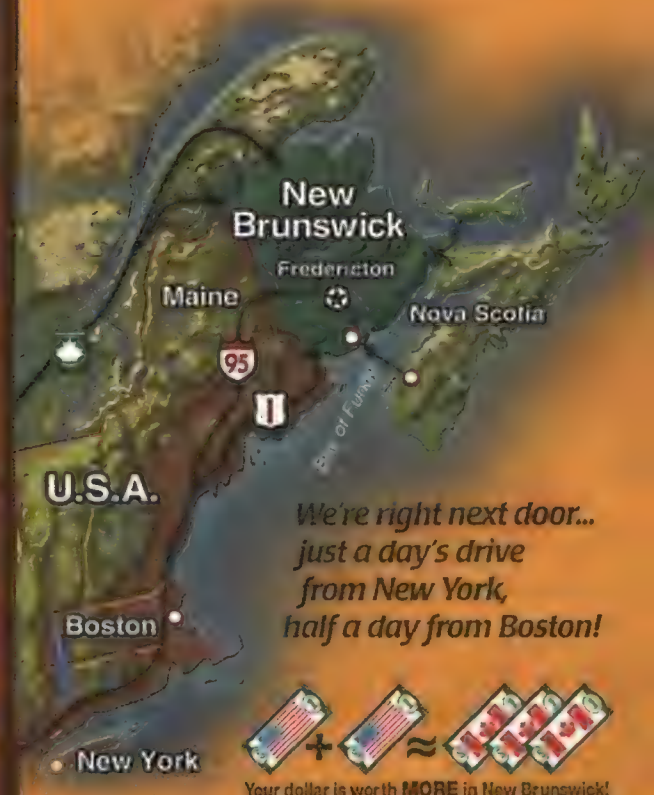

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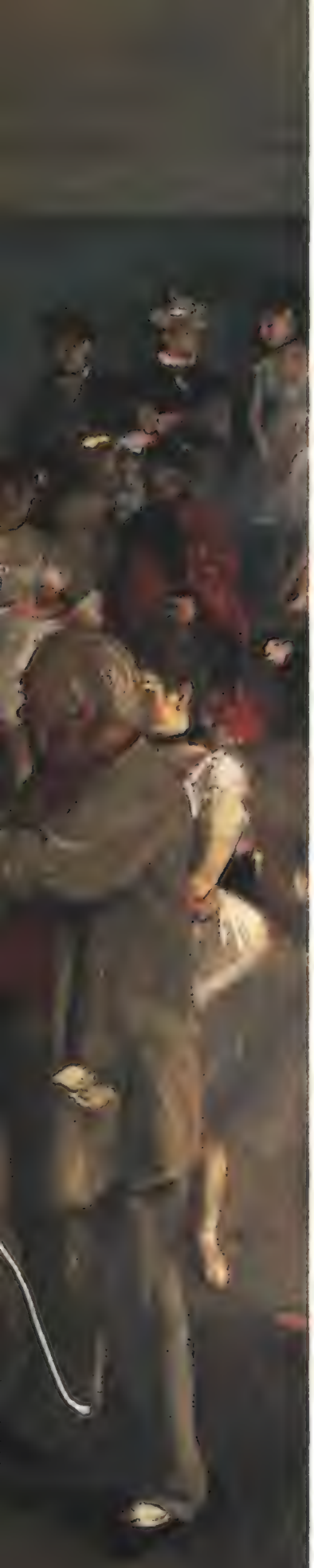

DEGAS

AND HIS DANCERS

A major exhibition and a new ballet bring the renowned artist's obsession with dance center stage – BY PAUL TRACHTMAN

"YESTERDAY I SPENT THE WHOLE DAY in the studio of a strange painter called Degas," Parisian man of letters Edmond de Goncourt wrote in his diary in 1874. "Out of all the subjects in modern life he has chosen washerwomen and ballet dancers . . . it is a world of pink and white . . . the most delightful of pretexts for using pale, soft tints." Edgar Degas, 39 years old at the time, would paint ballerinas for the rest of his career, and de Goncourt was right about the pretext. "People call me the painter of dancing girls," Degas later told Paris art dealer Ambroise Vollard. "It has never occurred to them that my chief interest in dancers lies in rendering movement and painting pretty clothes."

Degas loved to deflate the image people had of him, but his words ring true, expressing his love for the grace of drawing and the charm of color. As a student Degas dreamed of drawing like Raphael and Michelangelo, and he later revived the French tradition of pastels that had flourished with the 18th-century master Chardin. But like his contemporaries, Manet, Cézanne and the Impressionists, he lived in an age of photography and electricity, and he turned to aspects of modern life—to slums, brothels and horse races—to apply his draftsmanship. Bathing nudes became a favorite subject, but he once compared his more contemporary studies to those of Rembrandt with mocking wit. "He had the luck, that Rembrandt!" Degas said. "He painted Susanna at the bath; me, I paint women at the tub."

At the ballet Degas found a world that excited both his taste for classical beauty and his eye for modern realism. He haunted the wings and classrooms of the magnificent Palais Garnier, home of the Paris Opéra and its Ballet, where some of the city's poorest young girls struggled to become the fairies, nymphs and queens of the stage. As he became part of this world of pink and white, so full of tradition, he invented new techniques for drawing and painting it. He claimed the ballet for

Artist Mary Cassatt deemed Degas's boldly composed *Dance Class* (1874) "more beautiful than any Vermeer." Degas's *Little Dancer, Aged Fourteen* (left) was the inspiration for the Paris Opéra's new ballet.

modern art just as Cézanne was claiming the landscape. The writer Daniel Halévy, who as a youth often talked with Degas, later noted that it was at the Opéra that Degas hoped to find subjects of composition as valid as Delacroix had found in history.

Now Degas's pencil and chalk drawings, monotype prints and pastels, oil paintings and sculptures of ballerinas have been gathered from museums and private collections around the world for an exhibition entitled "Degas and the Dance." The show was organized by the American Federation of Arts along with the Detroit Institute of the Arts, where it was first shown last year, and the Philadelphia Museum of Art, where it is on display through May 11. In the accompanying catalog, guest curators and art historians Richard Kendall, a Degas authority, and Jill DeVonyar, a former ballet dancer, trace Degas's life backstage based on their research in the records of the Paris Opéra Ballet. And this month at the Palais Garnier, the Ballet will premiere a dazzling new work, *La Petite Danseuse de Degas*, about the ballerina who posed for Degas's most celebrated sculpture, the *Little Dancer, Aged Fourteen*. Sparked by research in the late 1990s by the ballet company's cultural director, Martine Kahane, and choreographed by Opéra ballet master Patrice Bart, the new work—part fact, part fantasy—is designed to evoke the world of ballet that entranced Degas and to capture the atmosphere of his paintings.

Renoir told the dealer Ambroise Vollard that he considered Degas (above, c. 1860-65, at about age 30) the greatest living sculptor.

The ballerinas Degas bequeathed to us remain among the most popular images in 19th-century art. The current exhibition is a reminder of just how daring the artist was in creating them. He cropped his pictures as a photographer would (and also became one); he defied traditional composition, opting for asymmetry and radical viewpoints; and he rubbed pastels over his monotype (or one-of-a-kind) prints, creating dramatic effects. Yet he always managed to keep an eye on the great masters of the past. His younger friend, the poet Paul Valéry, described him as "divided against himself; on the one hand driven by an acute preoccupation with truth, eager for all the newly introduced and more or less felicitous ways of seeing things and of painting them; on the other hand possessed by a rigorous spirit of classicism, to whose principles of elegance, simplicity and style he devoted a lifetime of analysis."

Degas became a painter in an extraordinary period and place. He was born in Paris in 1834, two years after Manet and during a decade that saw the birth of the painters Cézanne, Monet, Renoir and Berthe Morisot and the poets Mallarmé and Verlaine. His father was a banker and art lover who supported his son's studies, sending him in 1855 to the Ecole des Beaux Arts in Paris. The family had branches in Italy and in the United States (his mother was Creole, born in New Orleans), and young Degas went to Italy to study the masters, spending several years in Naples, Florence and Rome, where he copied Vatican treasures and Roman antiquities, before returning to Paris in 1859. There he at first labored with huge canvases—historical subjects and portraits like those Ingres and Delacroix had painted a generation before—for the Royal Academy's official Salon exhibitions. Then in 1862, while copying a Velázquez at the Louvre, Degas met the artist Edouard Manet, who drew him into the circle of Impressionist painters. It was in part due to Manet's influence that Degas turned to subjects from contemporary life, including café scenes, the theater and dance.

Degas's affluence was not unique among the painters of his day. His young friend Daniel Halévy called him "one of the children of the Second Empire," a period that had produced an enormously rich bourgeoisie. These artists, Halévy said, included "the Manets, the Degas, the Cézannes, the Puvis de Chavannes. They pursued their work without asking anything of anyone." As Halévy saw it, financial independence was the root of modern art in his day. "Their state of liberty is rare in the history of the arts, perhaps unique," he reflected. "Never were artists freer in their researches."

Degas found a studio and an apartment in the bohemian district of Montmartre, where he lived and worked most of his life. It was a quarter of artists' studios and cabarets, the well-off and the poor, washerwomen and prostitutes. As Kendall and DeVonyar point out, his neighbors over the years included Renoir, Gustave Moreau (later Matisse's teacher), Toulouse-Lautrec, Mary Cassatt and van Gogh, as well as musicians, dancers and other artists who worked at the Paris Opéra and its ballet. One of Degas's close friends was the writer Ludovic Halévy (Daniel's father), who collaborated with popular composers such as Delibes, Offenbach and Bizet. The artist could walk from his apartment to the gallery of art dealer Paul Durand-Ruel, where he showed one of his first ballet pictures in 1871, and to the old rue Le Peletier opera house, which was destroyed by fire in 1873.

Opera and ballet were a fashionable part of Parisian cultural life, and Degas was likely in the audience long before he began to paint the dancers. Indeed, some of his first dance paintings portray the audience and orchestra as prominently as the ballerinas onstage. Degas also wanted to get behind

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PAUL TRACHTMAN, an artist himself, wrote about the parallels in the work of Matisse and Picasso for the February 2003 issue.

BIBLIOTHÈQUE NATIONALE DE FRANCE; P. 88 METROPOLITAN MUSEUM OF ART, BEQUEST OF MRS. HARRY PAYNE BINGHAM; P. 89 PHILADELPHIA MUSEUM OF ART, THE HENRY P. MCILHENNY COLLECTION

The dramatically lit performers onstage in Degas's *Orchestra Musicians* (1870-71), noted for its unusual perspective, were among the first dancers he painted.

the scenes, but that wasn't easy. It was a privilege paid for by wealthy male subscription holders, called *abonnés,* who often lurked in the foyers, flirted with the dancers in the wings and laid siege to their dressing rooms. Degas at first had to invoke the help of influential friends to slip him into the ballerinas' private world (he would later become an abonné himself). In a circa 1882 letter to Albert Hecht, a prominent collector and friend, he wrote, "My dear Hecht, Have you the power to get the Opéra to give me a pass for the day of the dance examination, which, so I have been told, is to be on Thursday? I have done so many of these dance examinations without having seen them that I am a little ashamed of it."

For a time, Degas turned his attention to the abonnés, stalking them as they stalked the dancers. In the 1870s the elder Halévy had written a series of stories, *The Cardinal Family*, satirizing the often sordid affairs of young dancers, their mothers and the abonnés. Degas produced a suite of monotype prints for the stories, portraying the abonnés as dark, top-hatted figures. (Similar figures would appear in some of his other compositions as well.) Although Halévy didn't use them when the collection was published, they are among Degas's most haunting dance images, with a realism reminiscent of the caricatures of his contemporary, Daumier.

Though Degas exhibited his work with the Impressionists, his realism always set him apart. The Impressionists, complained the poet Valéry, "reduced the whole intellectual side of art to a few questions about texture and the coloring of shadows. The brain became nothing but retina." Degas's contemporaries saw something more in his work. Daniel Halévy described it as a "depoetization" of life, a fascination with the simplest, most intimate, least beautiful gestures—ballerinas stretching at the bar, practicing positions, waiting in the wings, taking instruction, scratching themselves, tying their shoes, adjusting their tutus, rubbing sore muscles, fixing their hair, fanning, talking, flirting, daydreaming, and doing almost everything but dancing. Degas's pictures of ballerinas performing onstage convey exquisitely what makes ballet ballet—all that balance, grace and radiance that a contemporary critic called "mimed poetry, dream made visible." But, paradoxically, Degas preferred to portray ballet by stripping away the poetry and illusion to show the hard work, the boredom, the more common beauty behind the scenes. In a sonnet written about 1889, Degas addressed the young ballerinas: "One knows that in your world / Queens are made of distance and greasepaint."

Some complained that the greasepaint showed. Degas's idol Ingres, who had advised him as a neophyte painter to draw constantly from memory and nature, and who had painted dancing nymphs into his own romantic tableaus, longed for the more courtly ballet of earlier days. "We see wretches disfigured by their efforts, red, inflamed with fatigue, and so indecently strapped-up that they would be more modest if they were naked," he wrote.

In 1875, a new Paris opera house opened—the Palais Garnier, named after its architect, Charles Garnier. It was a towering edifice of marble ornament and gilded decor, all but encrusted with antique statuary and classic murals. Garnier designed a mirrored foyer for backstage, he wrote, "as a setting for the charming swarms of ballerinas, in their picturesque and coquettish costumes." To the young student dancers, affectionately called "petit rats," Degas with his sketch pad became a familiar sight. A backstage friend noted, "He comes here in the morning. He watches all the exercises in which the movements are analyzed, and . . . nothing in the most complicated step escapes his gaze." One ballerina later recalled that he "used to stand at the top or bottom of the many staircases . . . drawing the dancers as they rushed up and down." Sometimes he made notes on his drawings, criticizing a dancer's balance, or the placement of a leg. On one sketch he jotted down a teacher's comment about a student's awkwardness: "She looks like a dog pissing."

But the drawings Degas made backstage were few com-

STADTISCHE GALERIE IM STADELSCHEN KUNSTINSTITUT, FRANKFURT

pared with the prodigious number he produced in his studio, where he paid petit rats and accomplished ballerinas to pose. In fact, Degas's studio was once visited by an inspector from the police morals unit, wanting to know why so many little girls were coming and going. "Think of it!" writes the Opéra's Martine Kahane. "The district of prostitutes and laundresses was alarmed!"

Degas enjoyed the company of these dancers, who shared gossip with him as they posed, but his affection for them was paternal. Trying to advance the career of one young dancer, he wrote to Ludovic Halévy, "You must know what a dancer is like who wants you to put in a word for her. She comes back twice a day to know if one has seen, if one has written. . . . And she wants it done at once. And she would like, if she could, to take you in her arms wrapped in a blanket and carry you to the Opéra!"

"The dance instills in you something that sets you apart," Degas wrote in a sonnet to the Opéra's ballet students. "Something heroic and remote." He captures the anguish of the art's physical demands in his pastel *Dancer Stretching.*

Unlike his brother Achille, who had an affair with a ballerina, Degas seems to have remained chaste and was, in the view of many, a misogynist. When told that a certain lady failed to show up at one of his dinners because she was "suffering," he relayed her comment scornfully to a friend. "Wasn't it true?" the friend asked. "How does one ever know?" retorted Degas. "Women invented the word 'suffering.'" Yet he became close friends with a number of women, including painters Mary Cassatt and Berthe Morisot, and some of the leading opera divas and prima ballerinas of the day.

Later in life Degas gained a reputation as a recluse, even a misanthrope. This was partly because his eyesight began failing in the 1870s, a problem that often depressed him. But his biting wit helped to isolate him as well. "I am not a misanthrope, far from it," he told Daniel Halévy in 1897, "but it is sad to live surrounded by scoundrels." He could put people off—"I want people to believe me wicked," he once declared—but he had misgivings about his attitude. In his 60s, he wrote to a friend, "I am meditating on the state of celibacy, and a good three quarters of what I tell myself is sad."

The sketches Degas made in his studio and backstage at the Opéra were only the starting point for an artist who loved to experiment and rarely considered anything finished. He would make repeated tracings from his drawings as a way of correcting them, recalled Vollard. "He would usually make the corrections by beginning the new figure outside of the original outlines, the drawing growing larger and larger until a nude no bigger than a hand became life-size—only to be abandoned in the end." The single figures in his sketches would show up in his paintings as part of a group, only to reappear in other scenes in other paintings.

When a friend taught him how to make a monotype print by drawing on an inked plate that was then run through a press, Degas at once did something unexpected. After making one print, he quickly made a second, faded impression from the leftover ink on the plate, then worked with pastels and gouache over this ghostly image. The result was an instant success—a collector bought the work, *The Ballet Master,* on the advice of Mary Cassatt.

More important, this technique gave Degas a new way to depict the artificial light of the stage. The soft colors of his pastels took on a striking luminosity when laid over the harsher black-and-white contrasts of the underlying ink. Degas showed at least five of these images in 1877 at the third Impressionist exhibition in Paris—a show that, art historian Charles Stuckey points out, included "the daring series of smoke-filled views inside the Gare St. Lazare by Monet and the large, sun-speckled group portrait at the Moulin de la Galette by Renoir."

During the last 20 years of his career, Degas worked in a large fifth-floor studio in lower Montmartre above his living quarters and a private museum for his own art collection. Paul Valéry sometimes visited him there: "He would take me into a long attic room," Valéry wrote, "with a wide bay window (not very clean) where light and dust mingled

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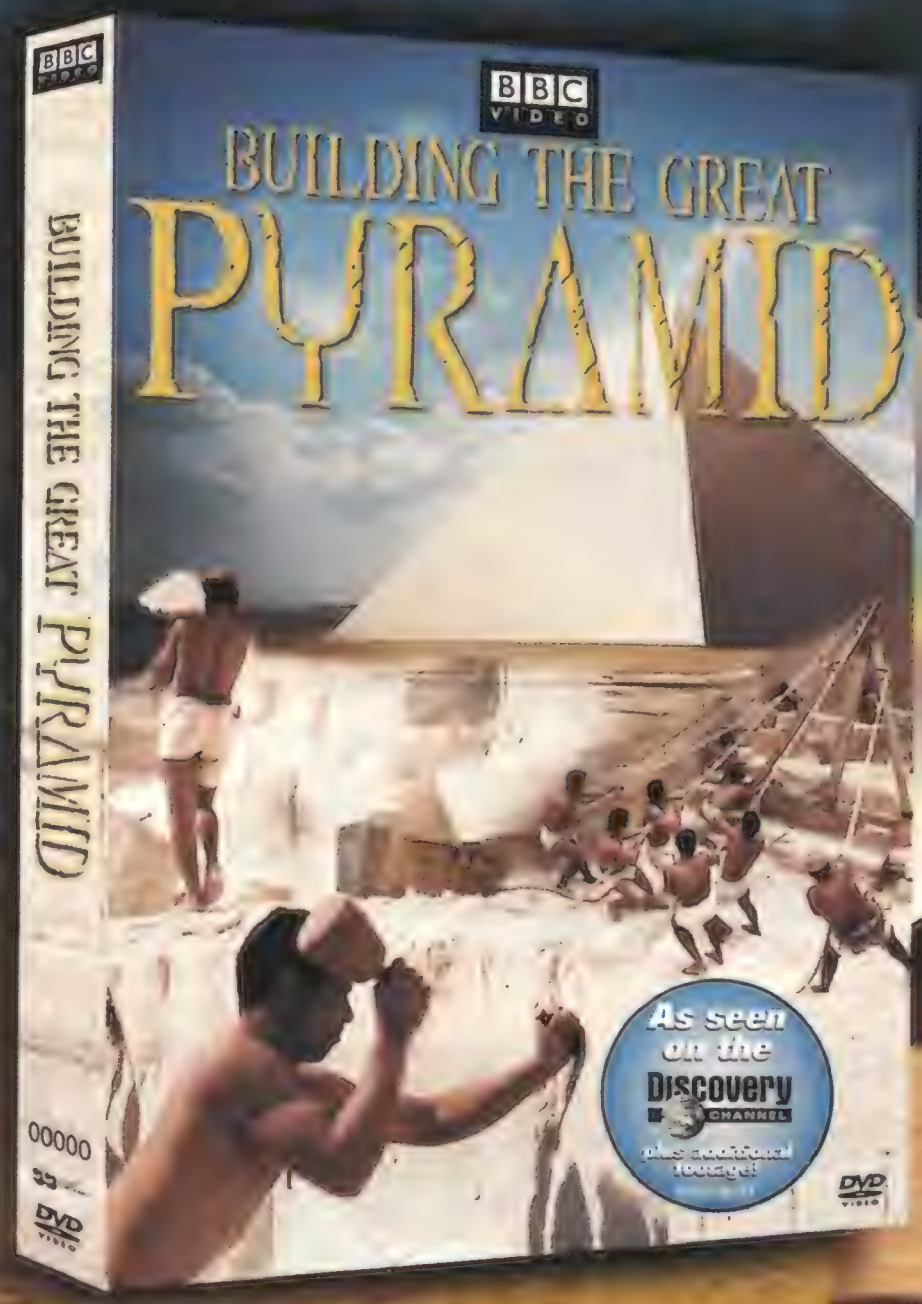

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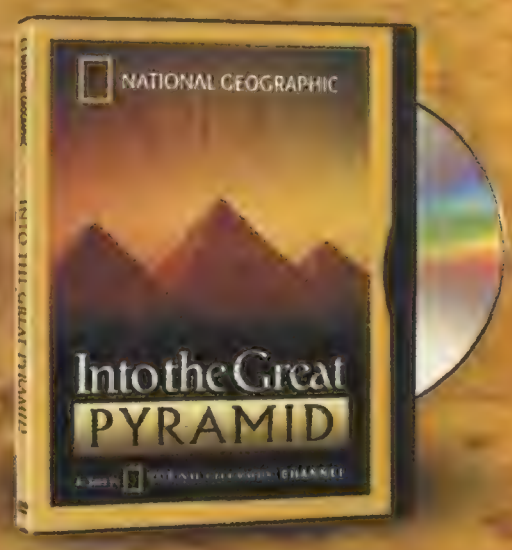

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gaily. The room was pell-mell—with a basin, a dull zinc bathtub, stale bathrobes, a dancer modeled in wax with a real gauze tutu in a glass case, and easels loaded with charcoal sketches." Valéry and other visitors also noticed stacks of paintings turned against the walls, a piano, double basses, violins and a scattering of ballet shoes and dusty tutus. Prince Eugen of Sweden, who visited in 1896, "wondered how Degas could find any specific color in the jumble of crumbling pastels."

The wax model of a dancer in a tutu standing in a glass case was undoubtedly Degas's *Little Dancer, Aged Fourteen*. When it was first shown, at the sixth Impressionist exhibition in 1881, the work was adorned with a real costume and hair. Two-thirds life-size, it was too real for many viewers, who found her "repulsive," a "flower of the gutter." But in her pose Degas had caught the essence of classical ballet, beautifully illustrating an 1875 technique manual's admonition that a ballerina's "shoulders must be held low and the head lifted. . . . " Degas never exhibited the *Little Dancer* again, keeping it in his studio among the many other wax models that he used for making new drawings. The sculpture was cast in bronze (some 28 are now known to exist) only after his death in 1917, at age 83.

The girl who posed for Degas's *Little Dancer*, Marie van Goethem, lived near his studio and took classes at the Opéra's ballet school. She was one of three sisters, all training to become ballerinas, and all apparently sketched by Degas. According to Martine Kahane, Marie passed all her early exams, rising from the ranks of petit rats to enter the corps de ballet at 15, a year after Degas made the sculpture. But only two years later, she was dismissed because she was late or absent at the ballet too often. Madame van Goethem, a widow who was working as a laundress, was apparently prostituting her daughters. In an 1882 newspaper clipping titled "Paris at Night," Marie was said to be a regular at two all-night cafés, the Rat Mort and the brasserie des Martyrs, hangouts of artists, models, bohemians, journalists and worse. The writer continued, "Her mother . . . But no: I don't want to say any more. I'd say things that would make one blush, or make one cry." Marie's older sister, Antoinette, was arrested for stealing money from her lover's wallet at a bar called Le Chat Noir, and landed in jail for three months. The youngest sister, Charlotte, became a soloist with the Ballet and, it would be nice to think, lived happily ever after. But Marie seems to have disappeared without a trace.

Emile Zola made novels of such tales, and now the Opéra's ballet master, Patrice Bart, 58, has turned Marie's story into a modern ballet. For Bart, who joined the ballet school at age 10, it's a labor of love. "A lot of the story took

The Paris Opéra's ballet master Patrice Bart rehearses his new ballet, *La Petite Danseuse de Degas* (based on the artist's best-known sculpture and due to premiere later this month), with Mélanie Hurel, one of the lead dancers.

ERIC SANDER

"A gifted mimic, even a clown," according to one scholar, Degas (right, hamming it up with his friends Jacques and Hortense Fourchy, c. 1895, outside a chateau in Normandy) was known, on occasion, to perform the steps of a dance.

place in the Palais Garnier," he says. "And I have been living in the Palais Garnier for 42 years. Voilà!" He won a place in the corps de ballet at 14, and became an *étoile*, or star, in his 20s. In the 1980s he danced for the company's renowned director, Russian defector Rudolf Nureyev, and at age 40 he took on the role of ballet master and choreographer.

In his new ballet, Bart comes to grips with the same issue that confronted Degas: the synthesis of tradition and innovation. "I was a classical dancer," he says, "and I try to move slightly toward the modern stuff." Nureyev, he says, taught him to be aware of new ways of thinking, of dancing. "If you deny this, he believed, it will be the end of classical ballet. And that's what Degas did, working in a classical world, but the painting was very modern."

Bart's ballet opens with a ballerina posed like the *Little Dancer*, encased in a glass box. The glass drops down and the *Little Dancer* comes to life, stepping into a montage of scenes from her story as well as Bart's imagination. "There was no man in that story," he says, "but to make a ballet you have to have a man and a lady, to make pas de deux, pas de trois. So I added the role of the abonné, the ideal masculine man." In the ballet, the *Little Dancer* becomes an étoile before the evil mother corrupts her and she goes to prison. Throughout the piece, the dancers mix modern dance moves with their classical glissades and pirouettes. "And then," says Bart, "in a classical ballet from the 19th century you always have the white act, what we call the *ballet blanc*. So I thought I'd make a scene where she becomes a laundress, and the stage is filled with white sheets, and she sort of fades out, as when people die." As for Degas, he appears in Bart's ballet only as a mysterious, dark, top-hatted figure, like one of the abonnés he painted, wandering through the scenes. At the end of the ballet, the glass box comes up from the floor and the Little Dancer is once again trapped inside.

"I hope the ballet will bring Degas to life for young dancers now," Bart says. "That's why I created the role of the étoile, because it's every little girl starting school, thinking maybe one day. . . . And very few get there. I want to create the atmosphere of Degas, but not as in a museum. It's like a painting coming to life."

Degas would surely have loved to see these dancers at work on a ballet inspired by his creation. "With the exception of the heart, it seems to me that everything within me is growing old in proportion," he wrote to a friend in January 1886. "And even this heart of mine has something artificial. The dancers have sewn it into a bag of pink satin, pink satin slightly faded, like their dancing shoes." ○

BIBLIOTHÈQUE NATIONALE DE FRANCE

A Conversation with Maya Angelou at 75

"I'm considered wise, and sometimes I see myself as knowing. Most of the time, I see myself as wanting to know. I've never been bored in my life."

BY LUCINDA MOORE

TURNING 75 THIS MONTH, Maya Angelou has led many lives. She is best known as a writer, for her numerous books of poetry and her six poignant memoirs, including the masterful 1969 *I Know Why the Caged Bird Sings.* In February, she won a Grammy for the recorded reading of her most recent memoir, *A Song Flung Up to Heaven.* Her works have earned her more than 30 honorary degrees as well as nominations for a National Book Award and a Pulitzer Prize. She wrote "On the Pulse of Morning" for the 1993 swearing-in of President Bill Clinton, becoming only the second poet in U. S. history—Robert Frost was the first, for John F. Kennedy—invited to compose an inaugural poem.

Less well known are Angelou's other lives: as a singer; as a composer; as a dancer in *Porgy and Bess*; as an actor in the Obie-winning play *The Blacks* and in films such as *Calypso Heat Wave* and *How to Make an American Quilt*; as a civil rights worker with Martin Luther King, Jr.; as a journalist in Egypt and Ghana; as a writer for television and Hollywood; as director of the 1998 film *Down in the Delta*. Angelou is the Reynolds Professor of American Studies at North Carolina's Wake Forest University in Winston-Salem. She is constantly on the lecture circuit and a regular guest on talk shows; she recently created a line of greeting cards for Hallmark. And there is little sign of her slowing down.

But when we met recently in her art-filled home in Winston-Salem, it was her family, not her varied career, that she most wanted to discuss. Our conversation often returned to the loved ones who helped her triumph over the tragedies of her childhood and made her believe she could meet whatever challenge life threw in her path.

Her grandmother Annie Henderson was one of the most important, a pious woman who ran a general store in Stamps, Arkansas. Angelou lived most of her childhood with her grandmother, whom she called "Momma." Angelou's sometimes-absentee mother, Vivian Baxter, had a steel will and several careers of her own. She was an inadvertent player in an early, formative trauma in Angelou's life. When Angelou was 8 and briefly living with Baxter in St. Louis, her mother's boyfriend raped Angelou. The man was arrested, convicted and released; soon after, he was found beaten to death. Believing she had caused the killing because she had told of the rape, Angelou refused to speak for several years; only her beloved older brother, Bailey, could coax her to talk. He remained a source of support throughout her life until his death more than a year ago. And there is Angelou's son, Guy Johnson, 57, author of *Echoes of a Distant Summer* and one other novel. He is, she says, her "monument in the world."

MOORE: You've said that society's view of the black woman is such a threat to her well-being that she will die daily unless she determines how she sees herself. How do you see yourself?

ANGELOU: I just received a letter yesterday from the University of Milan. A person is doing a doctoral dissertation on my work. It's called *Sapienza*, which means wisdom. I'm considered wise, and sometimes I see myself as knowing. Most of the time, I see myself as wanting to know. And I see myself as a very interested person. I've never been bored in my life.

MOORE: You have never been bored? How is that possible?

ANGELOU: Oh God, if I were bored, now *that* would interest me. I'd think, my God, how did that happen and what's going on? I'd be caught up in it. Are you kidding? Bored?

I realized when I was about 20 that I would die. It frightened me so. I mean, I had heard about it, had been told and all that, but that I . . . ? [She points at herself and raises her brows as if in disbelief.] It so terrified me that I double-locked the doors; I made certain that the windows were double-locked—trying to keep death out—and finally I admitted that there was nothing I could do about it. Once I really came to that conclusion, I started enjoying life, and I enjoy it very much.

Another occurrence took place at about the same time—maybe about a year later—and the two occurrences liberated me forever.

I had two jobs. I was raising my son. We had a tiny little place to live. My mother had a 14-room house and someone to look after things. She owned a hotel, lots of diamonds. I wouldn't accept anything from her. But once a month she'd cook for me. And I would go to her house and she'd be dressed beautifully.

One day after we'd had lunch, she had to go somewhere. She put on silver-fox furs—this was when the head of one fox would seem to bite into the head of the other—and she would wear them with the tails in front; she would turn it around with the furs arching back. We were halfway down the hill and she said, "Baby"—and she was small; she was 5-feet-4 1/2 and I'm 6 foot—"You know something? I think you're the greatest woman I've ever met." We stopped. I looked down at this pretty little woman made up so perfectly, diamonds in her ears. She said, "Mary McLeod Bethune, Eleanor Roosevelt, my mother and you—you are the greatest." It still brings me to te—. [Her eyes tear up.]

We walked down to the bottom of the hill. She crossed the street to the right to get into her car. I continued

At Bill Clinton's 1993 inauguration, Angelou called for harmony: "Do not be wedded forever / To fear, yoked eternally / To brutishness."

LEIF SKOOGFORS / CORBIS; P. 96 DENNIS VAN TINE / GAMMA

across the street and waited for the streetcar. And I got onto the streetcar and I walked to the back. I shall never forget it. I remember the wooden planks of the streetcar. The way the light came through the window. And I thought, suppose she's right? She's very intelligent, and she's too mean to lie. Suppose I really *am* somebody?

Those two incidents liberated me to think large thoughts, whether I could comprehend them or not [she laughs], but to think. . . .

MOORE: One of your large thoughts must have been about planning to have a diverse life and career. How do you move so easily from one thing to another?

ANGELOU: I have a theory that nobody understands talent any more than we understand electricity. So I think we've done a real disservice to young people by telling them, "Oh, you be careful. You'll be a jack-of-all-trades and a master of none." It's the stupidest thing I've ever heard. I think you *can* be a jack-of-all-trades and a mistress-of-all-trades. If you study it, and you put reasonable intelligence and reasonable energy, reasonable electricity to it, you can do that. You may not become Max Roach on the drums. But you can learn the drums. I've long felt that way about things. If I'm asked, "Can you do this?" I think, if I don't do it, it'll be ten years before another black woman is asked to do it. And I say, yes, yes, when do you want it?

My mom, you know, was a seaman. At one point, I was in Los Angeles. I called her in San Francisco and said, I want to see you, I'm going to New York and I don't know when I'll be back, so let's meet mid-state. She said, "Oh, baby, I wanted to see you, too, because I'm going to sea." I said, going to *see* what? She said, "I'm going to become a seaman." I said, Mother, really, come on. She said, "No, they told me they wouldn't let women in their union. I told them, 'You wanna bet?' I put my foot in that door up to my hip so women of every color will get in that union, get aboard a ship and go to sea." She retired in 1980, and Asian, white and black women gave a party for her. They called her the mother of the sea.

So, yes, we cripple our children, we cripple each other with those designations that if you're a brick mason you shouldn't love the ballet. Who made that rule? You ever see a person lay bricks? [She moves her hands in a precise bricklaying manner.] Because of the eye and the hands, of course he or she would like to see ballet. It is that precise, that established, that organized, that sort of development from the bottom to the top.

MOORE: Do you resent the fact that your mother wasn't there for much of your childhood?

ANGELOU: Oh, yes. Yes. I was an abandoned child as far as I was concerned, and Bailey also. We didn't hear from her—we heard maybe twice in seven years or something. And then I realized that she was funny and loving and that there are certainly two different kinds of parents. There is the person who can be a great parent of small children. They dress the children in these sweet little things with bows in their hair and beads on their shoestrings and nice, lovely little socks. But when those same children get to be 14 or 15, the parents don't know what to say to them as they grow breasts and testosterone hits the boy.

Well, my mom was a terrible parent of young children. And thank God—I thank God every time I think of it—I was sent to my paternal grandmother. Ah, but my mother was a great parent of a young adult. When she found out I was pregnant, she said, "All right. Run me a bath, please." Well, in my family, that's really a very nice thing for somebody to ask you to do. Maybe two or three times in my life she had asked me to run her a bath. So I ran her a bath and then she invited me in the bathroom. My mother sat down in the bathtub. She asked me, "Do you love the boy?" I said no. "Does he love you?" I said no. "Well, there's no point in ruining three lives. We're going to have us a baby."

And she delivered Guy—because she was a nurse also. She took me to the hospital. It was during one of the Jewish holidays, and my doctor wasn't there. My mother went in, told the nurses who she was, she washed up, they took me into the delivery room. She got up on the table on her knees with me and put her shoulder against my knee and took my hand, and every time a pain would come she'd tell a joke. I would laugh and laugh [she laughs uproariously] and bear down. And she said, "Here he comes, here he comes." And she put her hand on him first, my son.

So throughout her life she liberated me. Liberated me constantly. Respected me, respected what I tried to do, believed in me. I'd go out in San Francisco—I'd be visiting her, I was living in Los Angeles—and stay really late at some afterhours joint. Mother knew all of them and knew all the bartenders. And I'd be having a drink and laughing, and the bartender would say on the phone, "Yeah, Mama, yeah she's here." She'd say to me: "Baby, it's your mother. Come home. Let the streets know you have somewhere to go."

MOORE: It seems your mother and Bailey always came to your rescue. Were they more vigilant, do you think, because you didn't speak for so long?

ANGELOU: All those years ago I'd been a mute, and my mother and my brother knew that in times of strife and extreme stress, I was likely to retreat to mutism. Mutism is so addictive. And I don't think its powers ever go away. It's as if it's just behind my view, just behind my right shoulder or my left shoulder. If I move quickly, it moves, so I can't see it. But it's always there saying, "You can always come back to me. You have nothing to do—just stop talking." So, when I've been in stress, my mother or my brother, or both sometimes, would come wherever I was, New York, California, anywhere, and say, "Hello, hello, talk to me. Come on, let's go. We'll have a game of Scrabble or pinochle and let's talk. Tell me a story." Because they were astute enough to recognize the power of mutism, I finally was astute enough to recognize the power of their love.

MOORE: What went through your mind during the years you were mute?
ANGELOU: Oh, yes, I memorized poetry. I would test myself, memorizing a conversation that went by when I wasn't in it. I memorized 60 Shakespearean sonnets. And some of the things I memorized, I'd never heard them spoken, so I memorized them according to the cadence that I heard in my head. I loved Edgar Allan Poe and I memorized everything I could find. And I loved Paul Laurence Dunbar—still do—so I would memorize 75 poems. It was like putting a CD on. If I wanted to, I'd just run through my memory and think, that's one I want to hear.

So I believe that my brain reconstructed itself during those years. I believe that the areas in the brain which provide and promote physical speech had nothing to do. I believe that the synapses of the brain, instead of just going from A to B, since B wasn't receptive, the synapses went from A to R. You see what I mean? And so, I've been able to develop a memory quite unusual, which has allowed me to learn languages, really quite a few. I seem to be able to direct the brain; I can say, do that. I say, remember this, remember that. And it's caught! [She snaps her fingers as if to emphasize "caught."]

"Music was my refuge," wrote Angelou (shown at a 1997 New Orleans music festival) in *Singin' and Swingin' and Gettin' Merry Like Christmas.*

MOORE: You lived with your grandmother during your silent years. How did she respond?
ANGELOU: She said, "Sister, Momma don't care what these people say, that you must be an idiot, a moron, 'cause you can't talk. Momma don't care. Momma know that when you and the good Lord get ready, you gon' be a teacher."

MOORE: If your mother liberated you to think big, what gifts did your grandmother give you?
ANGELOU: She gave me so many gifts. Confidence that I was loved. She taught me not to lie to myself or anyone else and not to boast. She taught me to admit that, to me, the emperor has no clothes. He may be dressed in the finery of the ages to everybody else, but if I don't see it, to admit that I don't see it. Because of her, I think, I have remained a very simple woman. What you see is all there is. I have no subterfuge. And she taught me not to complain.

My grandmother had one thing that she would do for me about twice a year. Shall I tell you? [She laughs loudly.] Momma would see a whiner, a complainer come down the hill. And she would call me in. She'd say, "Sister, Sister, come out here." I'd go and look up the hill and a complainer was trudging. And the man or woman would come into the store, and my grandmother would ask, "How you feel today?"

"Ah, Sister Henderson, I tell you I just hate the winter. It makes my face crack and my shins burn."

And Momma'd just say, "Uh-huh," and then look at me. And as soon as the person would leave, my grandmother would say, "Sister, come here." I'd stand right in front of her. She'd say, "There are people all over the world who went to sleep last night who did not wake again. Their beds have become their cooling boards, their blankets have become their winding sheets. They would give anything for just five minutes of what she was complaining about."

MOORE: Did you write during your childhood?
ANGELOU: Well, I've always written. There's a journal which I kept from about 9 years old. The man who gave it to me lived across the street from the store and kept it when my grandmother's papers were destroyed. I'd written some essays. I loved poetry, still do. But I really, really loved it then. I would write some—of course it was terrible—but I'd always written something down.

MOORE: I read that you wrote the inaugural poem, "On the Pulse of Morning," in a hotel room. Were you on the road when you composed it?
ANGELOU: I keep a hotel room here in Winston when I'm writing. I take a room for about a month. And I try to be in the room by 6 a.m., so I get up, make coffee and keep a thermos and I go out to the hotel. I would have had everything removed from the room, wall hangings and all that stuff. It's just a bed, a table and a chair, *Roget's Thesaurus*, a dictionary, a bottle of sherry, a yellow pad and pens, and I go to work. And I work 'til about twelve or one; one if it's going well, twelve if it isn't. Then I come home and pretend to operate in the familiar, you know?

MOORE: Where does writing rank in your accomplishments?
ANGELOU: I'm happy to be a writer, of prose, poetry, every kind of writing. Every person in the world who isn't a recluse, hermit or mute uses words. I know of no other art form that we always use. So the writer has to take the most used, most familiar objects—nouns, pronouns, verbs, adverbs—ball them together and make them bounce, turn them a certain way and make people get into a romantic mood; and another way, into a bellicose mood. I'm most happy to be a writer. ○

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MARC BRASZ / CORBIS SYGMA

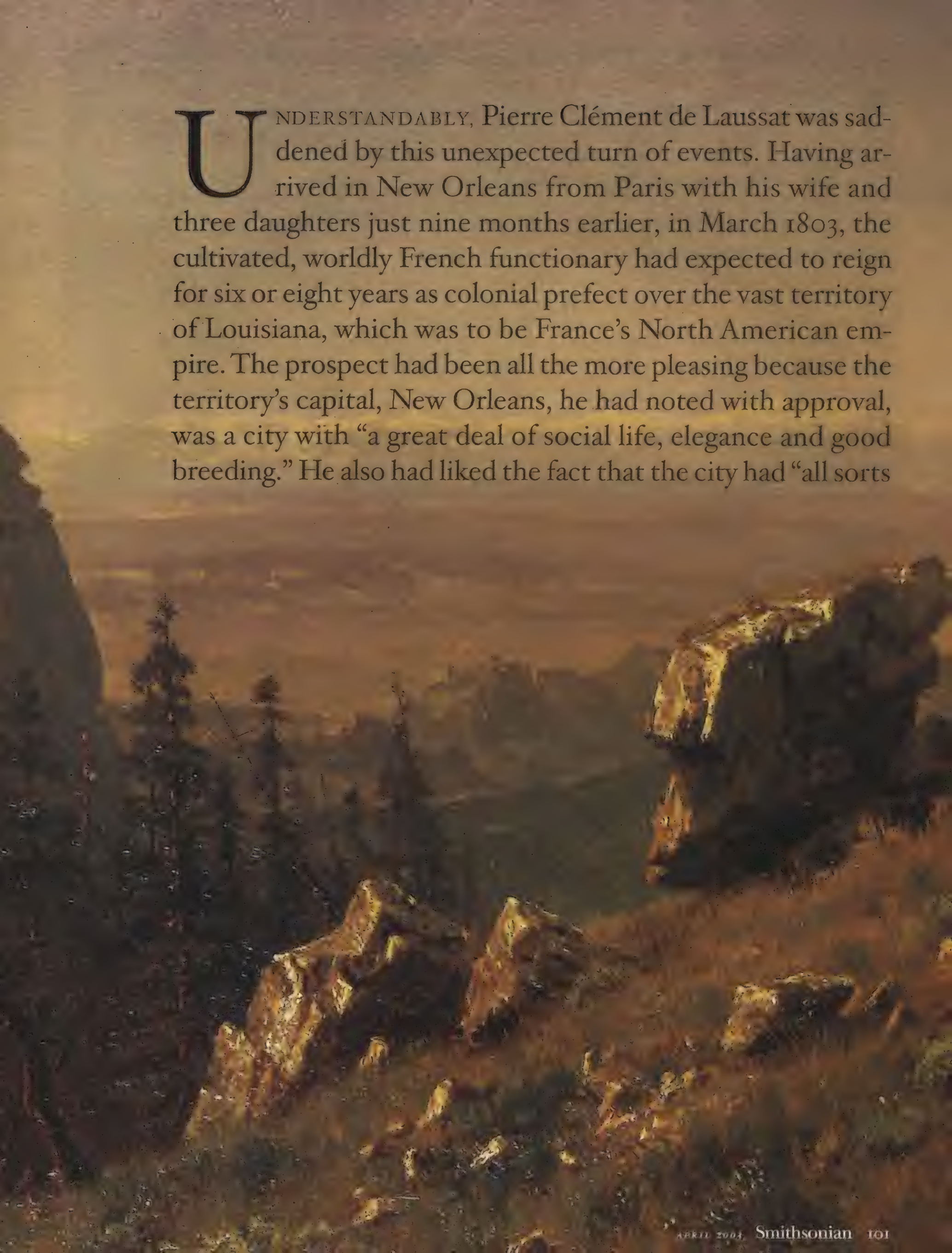
WESTWARD HO!

Two hundred years ago this month, Thomas Jefferson purchased the Louisiana Territory from France, changing the shape of a nation and the course of history

BY JOSEPH HARRISS

"The fertility of the country, its climate and extent," wrote Jefferson, promise "important aids to our treasury, an ample provision for our posterity, and a wide-spread field for the blessings of freedom." *Wind River Country* (1859) by Albert Bierstadt depicts Wyoming's Wind River Mountains, near the westernmost edge of the Louisiana Purchase.

UNDERSTANDABLY, Pierre Clément de Laussat was saddened by this unexpected turn of events. Having arrived in New Orleans from Paris with his wife and three daughters just nine months earlier, in March 1803, the cultivated, worldly French functionary had expected to reign for six or eight years as colonial prefect over the vast territory of Louisiana, which was to be France's North American empire. The prospect had been all the more pleasing because the territory's capital, New Orleans, he had noted with approval, was a city with "a great deal of social life, elegance and good breeding." He also had liked the fact that the city had "all sorts



of masters—dancing, music, art, and fencing," and that even though there were "no book shops or libraries," books could be ordered from France.

But almost before Laussat had learned to appreciate a good gumbo and the relaxed Creole pace of life, Napoléon Bonaparte had abruptly decided to sell the territory to the United States. This left Laussat with little to do but officiate when, on a sunny December 20, 1803, the French tricolor was slowly lowered in New Orleans' main square, the Place d'Armes, and the American flag was raised. After William C.C. Claiborne and Gen. James Wilkinson, the new commissioners of the territory, officially took possession of it in the name of the United States, assuring all residents that their property, rights and religion would be respected, celebratory salvos boomed from the forts around the city. Americans cried "Huzzah!" and waved their hats, while French and Spanish residents sulked in glum silence. Laussat, standing on the balcony of the town hall, burst into tears.

The Louisiana Purchase, made 200 years ago this month, nearly doubled the size of the United States. By any measure, it was one of the most colossal land transactions in history, involving an area larger than today's France, Spain, Portugal, Italy, Germany, Holland, Switzerland and the British Isles combined. All or parts of 15 Western states would eventually be carved from its nearly 830,000 square miles, which stretched from the Gulf of Mexico to Canada, and from the Mississippi River to the Rocky Mountains. And the price, $15 million, or about four cents an acre, was a breathtaking bargain. "Let the Land rejoice," Gen. Horatio Gates, a prominent New York state legislator, told President Thomas Jefferson when details of the deal reached Washington, D.C. "For you have bought Louisiana for a song."

Rich in gold, silver and other ores, as well as huge forests and endless lands for grazing and farming, the new acquisition would make America immensely wealthy. Or, as Jefferson put it in his usual understated way, "The fertility of the country, its climate and extent, promise in due season important aids to our treasury, an ample provision for our posterity, and a wide-spread field for the blessings of freedom."

American historians today are more outspoken in their enthusiasm for the acquisition. "With the Declaration of Independence and the Constitution, this is one of the three things that created the modern United States," says Douglas Brinkley, director of the Eisenhower Center for American Studies in New Orleans and coauthor with the late Stephen E. Ambrose of *The Mississippi and the Making of a Nation*. Charles A. Cerami, author of *Jefferson's Great Gamble*, agrees. "If we had not made this purchase, it would have pinched off the possibility of our becoming a continental power," he says. "That, in turn, would have meant our ideas on freedom and democracy would have carried less weight with the rest of the world. This was the key to our international influence."

The bicentennial is being celebrated with yearlong activities in many of the states fashioned from the territory. But the focal point of the celebrations is Louisiana itself. The most ambitious event opens this month at the New Orleans Museum of Art. "Jefferson's America & Napoléon's France" (April 12-August 31), an unprecedented exhibition of paintings, sculptures, decorative arts, memorabilia and rare documents, presents a dazzling look at the arts and leading figures of the two countries at this pivotal time in history. "What we wanted to do was enrich people's understanding of the significance of this moment," says Gail Feigenbaum, lead curator of the show. "It's about more than just a humdinger of a real estate deal. What kind of world were Jefferson and Napoléon living and working in? We also show that our political and cultural relationship with France was extraordinarily rich at the time, a spirited interchange that altered the shape of the modern world."

The "Louisiana territory" was born on April 9, 1682, when the French explorer Robert Cavelier, Sieur (Lord) de La Salle, erected a cross and column near the mouth of the Mississippi and solemnly read a declaration to a group of bemused Indians. He took possession of the whole Mississippi River basin, he avowed, in the name of "the most high, mighty, invincible and victorious Prince, Louis the Great, by Grace of God king of France and Navarre, 14th of that name." And it was in honor of Louis XIV that he named the land Louisiana.

In 1718, French explorer Jean-Baptiste le Moyne, Sieur de Bienville, founded a settlement near the site of La Salle's proclamation, and named it la Nouvelle Orléans for Philippe, Duke of Orléans and Regent of France. By the time of the Louisiana Purchase, its population of whites, slaves of African origin and "free persons of color" was about 8,000. A picturesque assemblage of French and Spanish colonial architecture and Creole cottages, New Orleans boasted a thriving economy based largely on agricultural exports.

For more than a century after La Salle took possession of it, the Louisiana Territory, with its scattered French, Spanish, Acadian and German settlements, along with those of Native Americans and American-born frontiersmen, was

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NATIONAL ARCHIVES; PP. 100, 101 EDWARD WILSON / FUND FOR FINE ARTS

THE LOUISIANA PURCHASE.

MESSRS. MONROE AND LIVINGSTONE COMPLETING NEGOTIATIONS WITH TALLYRAND, APRIL 30, 1803

Monroe and Livingston (above, standing) represented the U.S.; the wily Talleyrand (seated) and Barbé-Marbois (not shown) negotiated for France. Portraits (below) depict Jefferson as citizen president, Napoléon as ermine-robed emperor.

BETTMANN | CORBIS; DETAIL: CHATEAUX DE MALMAISON ET BOIS-PREAU, RUEIL-MALMAISON, FRANCE, FOUNDATION DOSNE-THIERS, MUSEE

traded among European royalty at their whim. The French were fascinated by America—which they often symbolized in paintings and drawings as a befeathered Noble Savage standing beside an alligator—but they could not decide whether it was a new Eden or, as the naturalist Georges-Louis Leclerc de Buffon declared, a primitive place fit only for degenerate life-forms. But the official view was summed up by Antoine de La Mothe Cadillac, whom Louis XIV named governor of the territory in 1710: "The people are a heap of the dregs of Canada," he sniffed in a 42-page report to the king written soon after he arrived. The soldiers there were untrained and undisciplined, he lamented, and the whole colony was "not worth a straw at the present time." Concluding that the area was valueless, Louis XV gave the territory to his Bourbon cousin Charles III of Spain in 1763. But in 1800, the region again changed hands, when Napoléon negotiated the clandestine Treaty of San Ildefonso with Spain's Charles IV. The treaty called for the return of the vast territory to France in exchange for the small kingdom of Etruria in northern Italy, which Charles wanted for his daughter Louisetta.

The territory was transferred to the U.S. in the Place d'Armes in New Orleans on December 20, 1803. By then, Lewis and Clark were preparing to head west.

When Jefferson heard rumors of Napoléon's secret deal, he immediately saw the threat to America's Western settlements and its vital outlet to the Gulf of Mexico. If the deal was allowed to stand, he declared, "it would be impossible that France and the United States can continue long as friends." Relations had been relaxed with Spain while it held New Orleans, but Jefferson suspected that Napoléon wanted to close the Mississippi to American use. This must have been a wrenching moment for Jefferson, who had long been a Francophile. Twelve years before, he had returned from a five-year stint as American minister to Paris, shipping home 86 cases of furnishings and books he had picked up there.

The crunch came for Jefferson in October 1802. Spain's King Charles IV finally got around to signing the royal decree officially transferring the territory to France, and on October 16, the Spanish administrator in New Orleans, Juan Ventura Morales, who had agreed to administer the colony until his French replacement, Laussat, could arrive, arbitrarily ended the American right to deposit cargo in the city duty-free. He argued that the three-year term of the 1795 treaty that had granted America this right and free passage through Spanish territory on the Mississippi had expired. Morales' proclamation meant that American merchandise could no longer be stored in New Orleans warehouses. As a result, trappers' pelts, agricultural produce and finished goods risked exposure and theft on open wharfs while awaiting shipment to the East Coast and beyond. The entire economy of America's Western territories was in jeopardy. "The difficulties and risks . . . are incalculable," warned the U.S. vice-consul in New Orleans, Williams E. Hulings, in a dispatch to Secretary of State James Madison.

As Jefferson had written in April 1802 to the U.S. minister in Paris, Robert R. Livingston, it was crucial that the port of New Orleans remain open and free for American commerce, particularly the goods coming down the Mississippi River. "There is on the globe one single spot," Jefferson wrote, "the possessor of which is our natural and habitual enemy. It is New Orleans, through which the produce of three-eighths of our territory must pass to market." Jefferson's concern was more than commercial. "He had a vision of America as an empire of liberty," says Douglas Brinkley. "And he saw the Mississippi River not as the western edge of the country, but as the great spine that would hold the continent together."

As it was, frontiersmen, infuriated by the abrogation of the right of deposit of their goods, threatened to seize New Orleans by force. The idea was taken up by lawmakers such as Senator James Ross of Pennsylvania, who drafted a resolution calling on Jefferson to form a 50,000-man army to take the city. The press joined the fray. The United States had the right, thundered the *New York Evening Post*, "to regulate the future destiny of North America," while the *Charleston Courier* advocated "taking possession of the port . . . by force of arms." As Secretary of State James Madison explained, "The Mississippi is to them everything. It is the Hudson, the Delaware, the Potomac, and all the navigable rivers of the Atlantic States, formed into one stream."

With Congress and a vociferous press calling for action, Jefferson faced the nation's most serious crisis since the American Revolution. "Peace is our passion," he declared, and expressed the concern that hotheaded members of the

BETTMANN / CORBIS; P. 104 CHICAGO HISTORICAL SOCIETY

opposition Federalist Party might "force us into war." He had already instructed Livingston in early 1802 to approach Napoléon's foreign minister, Charles Maurice de Talleyrand, to try to prevent the cession of the territory to France, if this had not already occurred, or, if the deal was done, to try to purchase New Orleans. In his initial meeting with Napoléon after taking up his Paris post in 1801, Livingston had been warned about Old World ways. "You have come to a very corrupt world," Napoléon told him frankly, adding roguishly that Talleyrand was the right man to explain what he meant by corruption.

A wily political survivor who held high offices under the French Revolution, and later under Napoléon's empire and the restored Bourbon monarchy, Talleyrand had spent the years 1792 to 1794 in exile in America after being denounced by the revolutionary National Convention, and had conceived a virulent contempt for Americans. "Refinement," he declared, "does not exist" in the United States.

As Napoléon's foreign minister, Talleyrand customarily demanded outrageous bribes for diplomatic results. Despite a clubfoot and what contemporaries called his "dead eyes," he could be charming and witty when he wanted—which helped camouflage his basic negotiating tactic of delay. "The lack of instructions and the necessity of consulting one's government are always legitimate excuses in order to obtain delays in political affairs," he once wrote. When Livingston tried to discuss the territory, Talleyrand simply denied that there was any treaty between France and Spain. "There never was a government in which less could be done by negotiation than here," a frustrated Livingston wrote to Madison on September 1, 1802. "There is no people, no legislature, no counselors. One man is everything."

But Livingston, although an inexperienced diplomat, tried to keep himself informed about the country to which he was ambassador. In March 1802, he warned Madison that France intended to "have a leading interest in the politics of our western country" and was preparing to send 5,000 to 7,000 troops from its Caribbean colony of Saint Domingue (now Haiti) to occupy New Orleans. But Napoléon's troops in Saint Domingue were being decimated by a revolution and an outbreak of yellow fever. In June, Napoléon ordered Gen. Claude Victor to set out for New Orleans from the French-controlled Netherlands. But by the time Victor assembled enough men and ships in January 1803, ice blocked the Dutch port, making it impossible for him to set sail.

That same month Jefferson asked James Monroe, a for-

The purchase (New Orleans, below, in 1803) nearly doubled the size of the United States. "You have bought Louisiana for a song," a New York state legislator exulted to Jefferson.

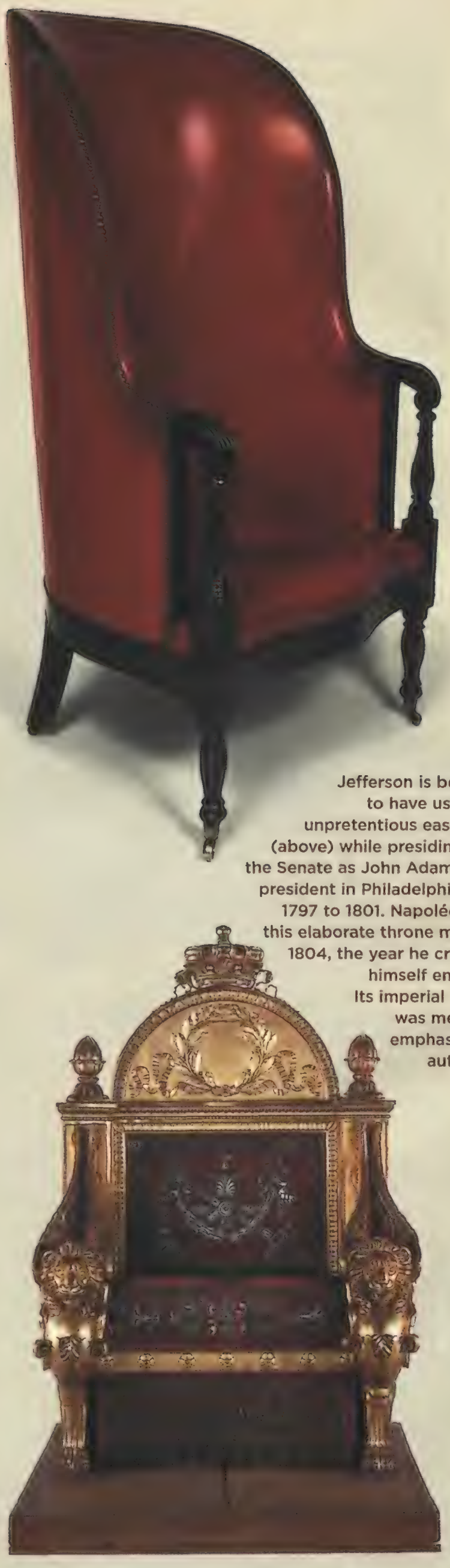
mer member of Congress and former governor of Virginia, to join Livingston in Paris as minister extraordinary with discretionary powers to spend $9,375,000 to secure New Orleans and parts of the Floridas (to consolidate the U.S. position in the southeastern part of the continent). In financial straits at the time, Monroe sold his china and furniture to raise travel funds, asked a neighbor to manage his properties, and sailed for France on March 8, 1803, with Jefferson's parting admonition ringing in his ears: "The future destinies of this republic" depended on his success.

By the time Monroe arrived in Paris on April 12, the situation had, unknown to him, radically altered: Napoléon had suddenly decided to sell the entire Louisiana Territory to the United States. He had always seen Saint Domingue, with a population of more than 500,000, producing enough sugar, coffee, indigo, cotton and cocoa to fill some 700 ships a year, as France's most important holding in the Western Hemisphere. The Louisiana Territory, in Napoléon's view, was useful mainly as a granary for Saint Domingue. With the colony in danger of being lost, the territory was less useful. Then, too, Napoléon was gearing up for another campaign against Britain and needed funds for that.

Napoléon's brothers Joseph and Lucien had gone to see him at the Tuileries Palace on April 7, determined to convince him not to sell the territory. For one thing, they considered it foolish to voluntarily give up an important French holding on the American continent. For another, Britain had unofficially offered Joseph a bribe of £100,000 to persuade Napoléon not to let the Americans have Louisiana. But Napoléon's mind was already made up. The First Consul happened to be sitting in his bath when his brothers arrived. "Gentlemen," he announced, "think what you please about it. I have decided to sell Louisiana to the Americans." To make his point to his astonished brothers, Napoléon abruptly stood up, then dropped back into the tub, drenching Joseph. A manservant slumped to the floor in a faint.

French historians point out that Napoléon had several reasons for this decision. "He probably concluded that, following American independence, France couldn't hope to maintain a colony on the American continent," says Jean Tulard, one of France's foremost Napoléon scholars. "French policy makers had felt for some time that France's possessions in the Antilles would inevitably be 'contaminated' by America's idea of freedom and would eventually take their own independence. By the sale, Napoléon hoped to create a huge country in the Western Hemisphere to serve as a counterweight to Britain and maybe make trouble for it."

On April 11, when Livingston called on Talleyrand for what he thought was yet another futile attempt to deal, the foreign minister, after the de rigueur small talk, suddenly asked whether the United States would perchance wish to buy the whole of the Louisiana Territory. In fact, Talleyrand was intruding on a deal that Napoléon had assigned to the French finance minister, François de Barbé-Marbois. The latter knew America well, having spent some years in Philadel-



Jefferson is believed to have used this unpretentious easy chair (above) while presiding over the Senate as John Adams' vice president in Philadelphia from 1797 to 1801. Napoléon had this elaborate throne made in 1804, the year he crowned himself emperor. Its imperial design was meant to emphasize his authority.

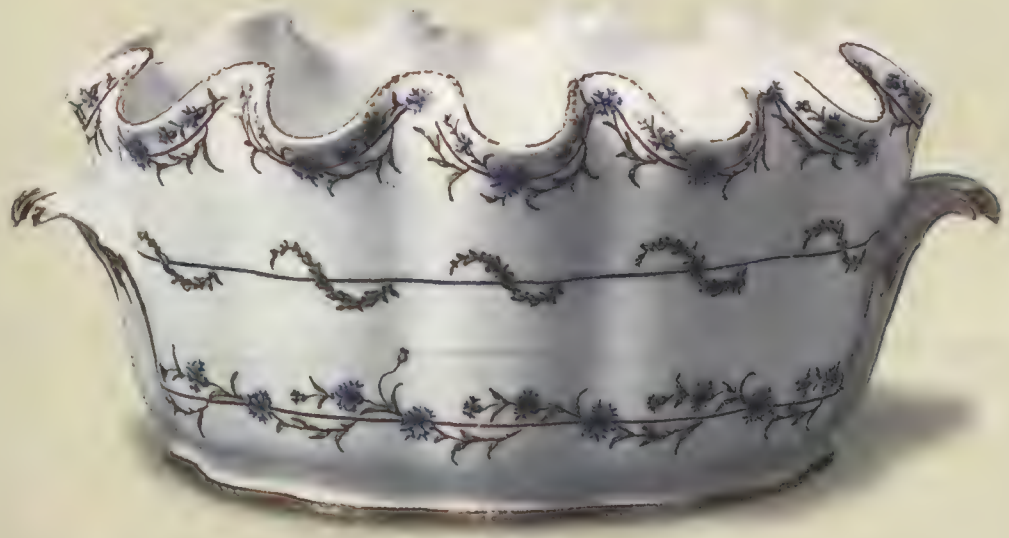
UNIVERSITY OF VIRGINIA; MUSÉE DES ARTS DÉCORATIFS

JEFFERSON'S AMERICA, NAPOLEON'S FRANCE

The New Orleans Museum of Art celebrates the bicentennial of the Louisiana Purchase

"We have tried to capture the suspense and fascination of a story whose outcome is known, yet was not foreordained," says Gail Feigenbaum, curator of the Jefferson-Napoléon show on view in New Orleans April 12 to August 31, "and to tell it through a rich variety of objects." The variety includes three important documents: a copy of the treaty, which bears Jefferson's signature; a document covering payment of claims by American citizens against France, signed by Napoléon; and the official report of transfer of the Louisiana Territory signed by a bereaved prefect, Pierre de Laussat. The exhibition points up how intertwined the two nations were at the time. A seascape (see p. 3) portrays the Marquis de Lafayette's ship *La Victoire* setting sail to carry him across the Atlantic in 1777 to fight in the American Revolution. (There is also a portrait of the marquis himself and a 1784 painting by French artist Jean Suau, *Allegory of France Liberating America*.) A mahogany and gilded bronze swan bed that belonged to the famous French beauty Juliette Récamier is also on display. Fashion-conscious American ladies reportedly imitated Récamier's attire, but not her custom of receiving visitors in her bedroom. And John Trumbull's huge painting *The Signing of the Declaration of Independence* documents the historic American event that so greatly impressed and influenced French revolutionary thinkers. It hangs not far from a color engraving of the French Declaration of the Rights of Man, which was composed in 1789 by Lafayette with the advice of his American friend Thomas Jefferson.

The painted robe with a hunt scene (above), from the Musée des Beaux-Arts et d'Archeologie in Besançon, France, is thought to be the work of the Illinois-Quapaw peoples. Jefferson acquired the Sèvres bowl (below), which was made for Louis XVI and used at Versailles, during his time as minister in Paris. Until her 1809 divorce from Bonaparte, the fashionable Josephine (right, in an 1808 portrait by Antoine-Jean Gros) was the most influential woman in all of France.



BESANÇON, MUSÉE DES BEAUX-ARTS ET D'ARCHEOLOGIE; THOMAS JEFFERSON MEMORIAL FOUNDATION; MUSÉE D'ART ET D'HISTOIRE, PALA

phia in the late 1700s as French ambassador to the United States, where he got to know Washington, Jefferson, Livingston and Monroe. Barbé-Marbois received his orders on April 11, 1803, when Napoléon summoned him. "I renounce Louisiana," Napoléon told him. "It is not only New Orleans that I will cede, it is the whole colony without reservation. I renounce it with the greatest regret. . . . I require a great deal of money for this war [with Britain]."

Thierry Lentz, a Napoléon historian and director of the Fondation Napoléon in Paris, contends that, for Napoléon, "It was basically just a big real estate deal. He was in a hurry to get some money for the depleted French treasury, although the relatively modest price shows that he was had in that deal. But he did manage to sell something that he didn't really have any control over—there were few French settlers and no French administration over the territory—except on paper." As for Jefferson, notes historian Cerami, "he actually wasn't out to make this big a purchase. The whole thing came as a total surprise to him and his negotiating team in Paris, because it was, after all, Napoléon's idea, not his."

Showing up unexpectedly at the dinner party Livingston gave on April 12 for Monroe's arrival, Barbé-Marbois discreetly asked Livingston to meet him later that night at the treasury office. There he confirmed Napoléon's desire to sell the territory for $22,500,000. Livingston replied that he "would be ready to purchase provided the sum was reduced to reasonable limits." Then he rushed home and worked until 3 a.m. writing a memorandum to Secretary of State Madison, concluding: "We shall do all we can to cheapen the purchase; but my present sentiment is that we shall buy."

Jefferson considered his design for the classically elegant Monticello (top), begun in 1768, "an essay in architecture." Napoléon would join his wife Josephine at her 17th-century château Malmaison, just outside Paris, between campaigns.

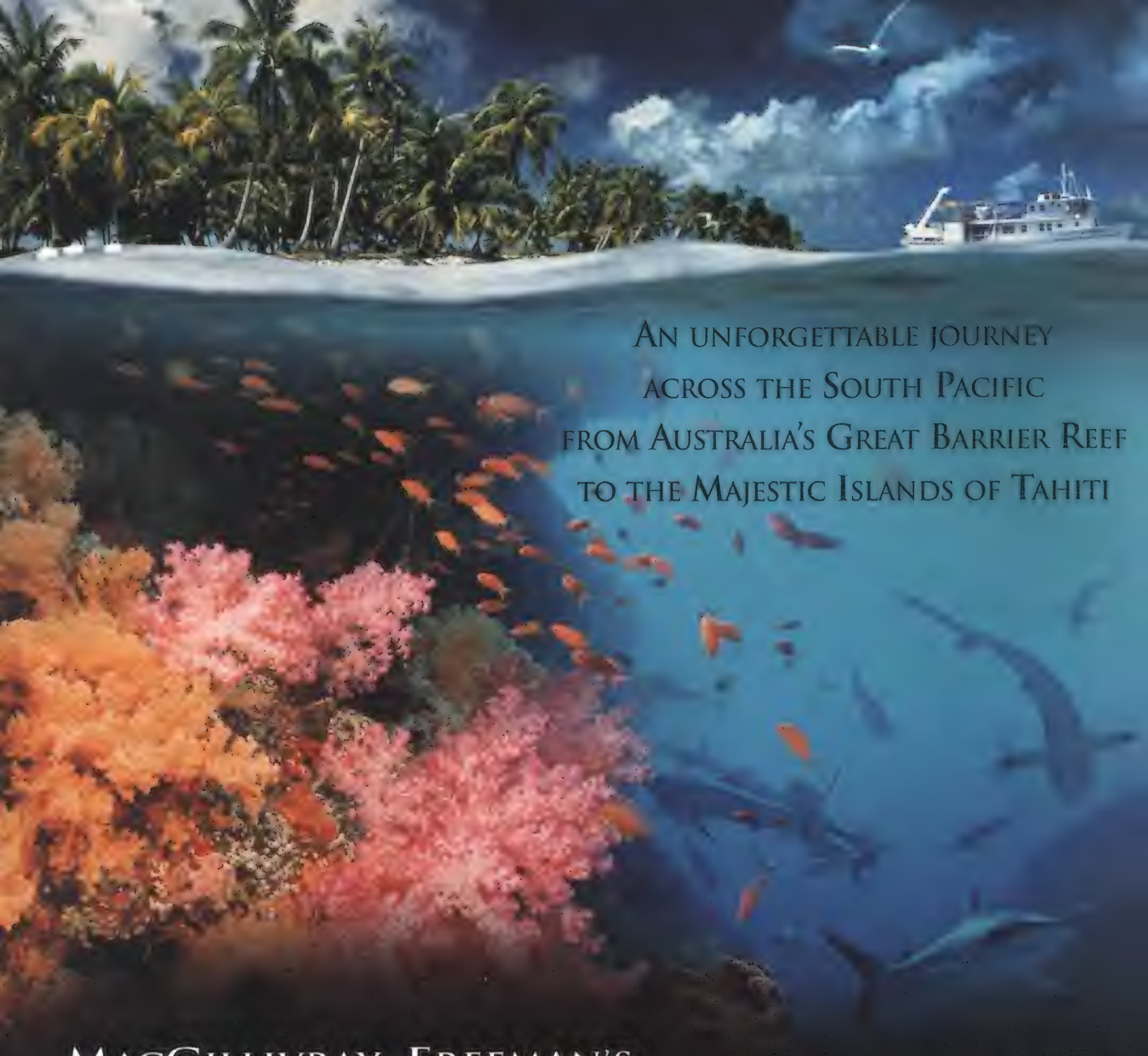
On April 15, Monroe and Livingston proposed $8 million. At this, Barbé-Marbois pretended Napoléon had lost interest. But by April 27, he was saying that $15 million was as low as Napoléon would go. Though the Americans then countered with $12.7 million, the deal was struck for $15 million on April 29. The treaty was signed by Barbé-Marbois, Livingston and Monroe on May 2 and backdated to April 30. Although the purchase was undeniably a bargain, the price was still more than the young U.S. treasury could afford. But the resourceful Barbé-Marbois had an answer for that too. He had contacts at Britain's Baring & Co. Bank, which agreed, along with several other banks, to make the actual purchase and pay Napoléon cash. The bank then turned over ownership of the Louisiana Territory to the United States in return for bonds, which were repaid over 15 years at 6 percent interest, making the final purchase price around $27 million.

Neither Livingston nor Monroe had been authorized to buy all of the territory, or to spend $15 million—transatlantic mail took weeks, sometimes months, each way, so they had no time to request and receive approval of the deal from Washington. But an elated Livingston was aware that nearly doubling the size of America would make it a major player on the world scene one day, and he permitted himself some verbal euphoria: "We have lived long, but this is the noblest work of our whole lives," he said. "From this day the United States take their place among the powers of the first rank."

It wasn't until July 3 that news of the purchase reached U.S. shores, just in time for Americans to celebrate it on Independence Day. A Washington newspaper, the *National Intelligencer*, reflecting how most citizens felt, referred to the "widespread joy of millions at an event which history will record among the most splendid in our annals." Though we have no historical evidence of how Jefferson felt about the purchase, notes Cerami, reports from those in his circle like Monroe refer to the president's "great pleasure," despite his fear that the deal had gone beyond his constitutional powers. Not all Americans agreed, however. The *Boston Columbian Centinel* editorialized, "We are to give money of which we have too little for land of which we already have too much." And Congressman Joseph Quincy of Massachusetts so opposed the deal that he favored secession by the Northeastern states, "amicably if they can; violently if they must."

The favorable majority, however, easily prevailed and New England remained in the Union. As for the ever-succinct Thomas Jefferson, he wasted little time on rhetoric. "The enlightened government of France saw, with just discernment," he told Congress, with typical tact, on October 17, 1803, "the importance to both nations of such liberal arrangements as might best and permanently promote the peace, friendship, and interests of both." But, excited by the commercial opportunities in the West, Jefferson, even before official notice of the treaty reached him, had already dispatched Meriwether Lewis to lead an expedition to explore the territory and the lands beyond. All the way to the Pacific. ○

MONTICELLO / THOMAS JEFFERSON FOUNDATION; MUSÉE NATIONAL DU CHÂTEAU DE MALMAISON



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THE CURSE OF COUNT DRACULA

The prospect of a tourist bonanza from a Dracula theme park in Transylvania excites some Romanians, but opponents see only red

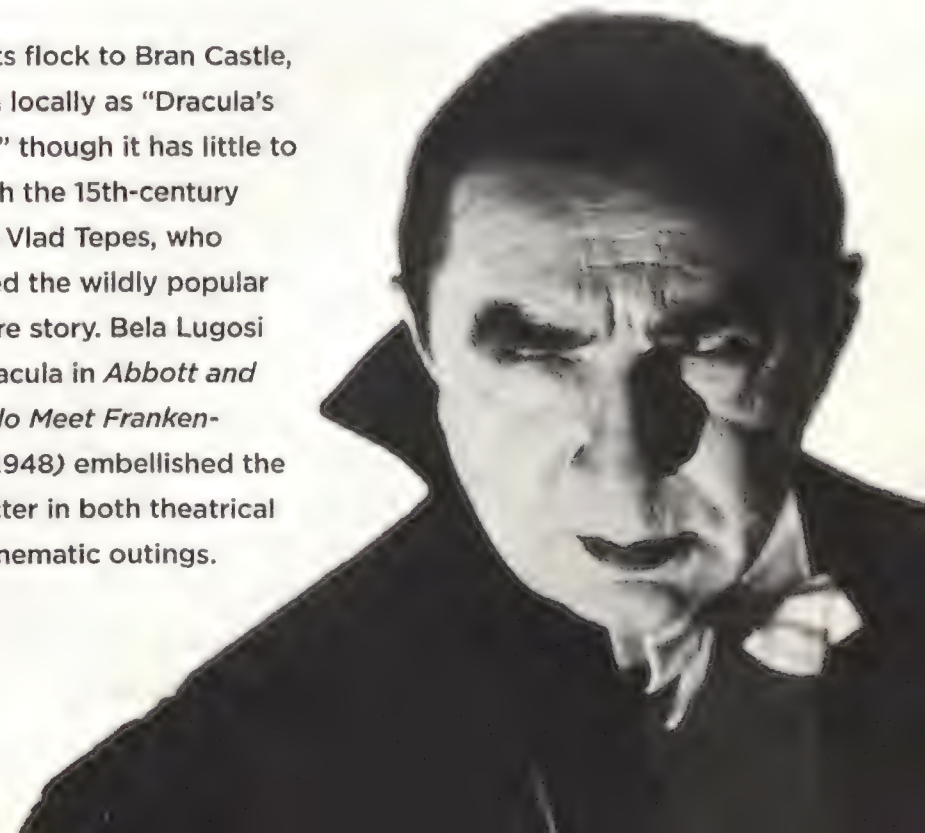
BY RUDY CHELMINSKI *PHOTOGRAPHS BY ROBERT WALLIS*

THE BREITE PLATEAU, a broad sheep-grazing ground of 300 acres or so, lies a couple of hundred miles north of Romania's capital, Bucharest, but only a ten-minute car ride from Sighisoara, the city of 38,000 that owns the land. Interspersed here and there across the plateau are 120 venerable oak trees. When I drove from Sighisoara to Breite to see those gnarly giants not long ago, I was accompanied by a couple of earnest young environmentalists who darkly warned that the trees would soon be felled. A large white billboard explained why. "*Aici se va construi* DRACULA PARK," announced the text in crimson letters: something called Dracula Park was to be built there.

Over the past year and a half, a furious controversy surrounding this proposal has focused attention on an area so obscure that many people today still assume it's fictitious: Transylvania. But located high within the curling grip of the rugged Carpathian Mountains in central Romania, Transylvania is as real as real can be—rich in mineral resources, blessed with fertile soil and filled with picturesque scenery. Although its name means "land beyond the forest," this historical province of more than seven million souls was not known as a particularly spooky place until 1897, when the Irish writer and critic Bram Stoker published his sensational gothic novel *Dracula*. Casting about for a suitable backdrop for his eerie yarn about a nobleman who happened to be a bloodsucking vampire, Stoker hit upon Transylvania, which he described as "one of the wildest and least known portions of Europe."

As it happened, Stoker never set foot there himself. English libraries provided all the maps and reference books he needed. His ghoulish imagination did the rest. Count Dracula, he of the "hard-looking mouth, with very red lips and sharp-looking teeth, as white as ivory," inhabited "a vast ruined castle, from whose tall black windows came no ray of light, and whose broken battlements showed a jagged line against the moonlit sky."

Dracula proved to be one of those rare tales that tap a vein deep within the human psyche. The book has never been out



Tourists flock to Bran Castle, known locally as "Dracula's castle," though it has little to do with the 15th-century prince Vlad Tepes, who inspired the wildly popular vampire story. Bela Lugosi (as Dracula in *Abbott and Costello Meet Frankenstein*, 1948) embellished the character in both theatrical and cinematic outings.

of print, and Transylvania, through no fault of its own, is doomed to be forever associated with the sanguinary count. Which explains both the billboard that went up last year on the Breite Plateau and the outrage it provoked.

It was Romania's own minister of tourism who came up with the idea of building a Dracula theme park in the heart of Transylvania. For the region as a whole, and in particular for the city of Sighisoara, it's only the latest chapter in a long history of unwelcome intrusions from the outside.

It began with the Romans, who arrived late in the first century to impose their harsh discipline and Latin tongue on the ancient Dacian people native to the area. Next came the Magyars from what is now Hungary, followed by various barbarians and Mongols, then the Turks of the Ottoman Empire. Back and forth they all went in true Balkan style, and the dust never quite settled.

Romania did not even exist as a nation before 1859, when, in the wake of the Crimean War, the principalities of Moldovia and Walachia united as a single state. Transylvania belonged to Austro-Hungary until 1918, when the Allied powers awarded it to the Bucharest regime after World War I. No matter what flag flew over it, though, Transylvania has been divided for centuries roughly between three ethnic groups: Romanians, Hungarians and Germans.

The Germans left the most indelible mark. Colonists from the Cologne archdiocese—Saxons, they were called, because in those days Germany didn't exist, either—first came to Transylvania during the 12th century. They preferred hills for their villages, walling them and grouping their houses in tight, defensible rows. Strategically placed in the centers of those citadels were the churches, the last sanctuaries into which an embattled population could retreat. The Saxons made sure their houses of God were as much fortresses as places of worship: massive stone towers with battlements and sentry walkways surrounded by walls with reinforced gates and defensive trenches. Some 150 of these mighty fortress churches remain in Transylvania today, and they are rightly valued among Romania's greatest national treasures.

Matei Dan, Romania's minister of tourism, decided in 2001 that it was "time Dracula went to work for Romania." A billboard announcing the park site went up near the town of Sighisoara, where Prince Tepes was born in a house that is now a restaurant—just a taste, say critics, of what lies in store for Transylvania.

The Saxons were talented, thrifty and hard working, but they also tended to be clannish, maintaining their own sectarian ways through the centuries. German schools invariably stood near German churches, and even today, 800 years after arriving in Transylvania, some Saxons still speak German, not Romanian, which antagonizes non-Saxons. Nicolae Ceausescu, the late, unlamented dictator who imposed a weirdly personalized form of communism on Romania from 1965 to 1989, was a fervent nationalist who actively strove to get rid of the minority Saxon culture.

In the end it was the minorities who finally got rid of Ceausescu. It happened more than a dozen years ago, and the place where trouble started was the city of Timisoara. After Ceausescu's secret police, the Securitate, fired on crowds demonstrating there against the regime, a nationwide revolution flared up; within days, Ceausescu and his wife were condemned by an anonymous court and executed by a firing squad. When I arrived in Timisoara to cover

RUDY CHELMINSKI wrote about the director of the Michelin Red Guide in the March issue. London-based ROBERT WALLIS has shot stories about Beirut and the Bosporus for SMITHSONIAN.

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that story, town authorities were still burying young people shot in the demonstrations, and the windows of my hotel room were pocked with bullet holes.

Returning to Transylvania last year, I found the area again in turmoil—this time over the plan to build Dracula Park. The chief promoter of that provocative scheme, Romania's minister of tourism, Matei Dan, 53, had a sudden inspiration two years ago while visiting a Madrid theme park devoted to Spanish history: Why not a theme park devoted to Dracula?

When I interviewed Dan in his opulent Bucharest office, he was in shirt sleeves and seething with energy. He bounced around shouting, "OK, I knew my project was unconventional. Original! Shocking! But I want to use it to attract a million tourists a year. Elsewhere in the world there is a very big industry about Dracula worth hundreds and hundreds of millions of dollars, but here in Romania it doesn't exist. And so I decided it is time Dracula went to work for Romania."

Few of his countrymen would argue with Dan's economic rationale, but proposing Sighisoara as the project site was another matter altogether. Known as the "Pearl of Transylvania," Sighisoara is the supreme example of a Saxon city. Founded as Schässburg toward the end of the 13th century, the old town remains perfectly preserved. It sits on a hill behind a 30-foot wall punctuated by nine defensive towers,

each built by a different guild: the shoemakers, the butchers, the rope makers, and so on.

Dan saw Sighisoara as a potential gold mine, with its cobbled lanes, beautiful buildings and stately towers. Not the least of its attractions is a hallowed house on the citadel's main square, identified as the birthplace of Vlad Tepes—literally, Vlad the Impaler. Ruler of Walachia in the mid-1400s, Vlad became one of Romania's most revered heroes for standing up to the invading Turks. His standard procedure for dealing with captives was to impale them on stakes, stick the stakes into the ground, then leave the unfortunates to die slowly. Legend holds that he once skewered no fewer than 20,000 victims in a single day.

Vlad must have been familiar with the ancient belief that souls of the deceased who had been damned for certain sins could rise from their graves and wander the countryside between dusk and dawn, slipping into houses and sucking the blood of sleeping innocents. Romanian peasants guarded against this by driving stakes into graves to pin corpses down.

The house of "Vlad the Impaler" lies in the center of Sighisoara's well-preserved, walled historic district, which dates to the 13th century and has been designated a UNESCO World Heritage Site. Uproar from preservationists, including England's Prince Charles, prompted planners to find another site for the Dracula Park.

Vlad's father, who was governor of Transylvania before him, lived in Sighisoara from 1431 to 1435, and was known as Vlad Dracul. In Romanian, *dracul* means devil.

That in a nutshell is the genesis of Stoker's gruesome tale: the name, the place, the blood lust and the all-important wooden stake, which Stoker reduced in size and turned into a heart-piercing vampire killer. Vlad Tepes lived in Sighisoara the first four years of his life. This is why Dan made up his mind that the Dracula amusement park must go there.

In the autumn of 2001, the minister displayed his elaborate plans to potential investors in a glossy 32-page brochure. It depicts a medieval castle complete with torture chamber, alchemy laboratory, vampire den and an initiation hall where "young vampires can be dubbed knights." The International Institute of Vampirology was to be located near Dracula Lake, a wide pond with a restaurant in the middle, and the Old Tower would house a workshop for teeth-sharpening. Restaurant fare was to include dishes of blood pudding, brains, and "fright-jellied" meat, a scraps and gelatin concoction.

When Dan's plans were made public in November, many of Romania's intellectuals and artists were horrified. The country had already suffered terrible depredations from Ceausescu's frenzied construction projects. Now, critics said, the Dracula scheme would cause even more injury. Unfortunately for the park's opponents, Sighisoara's mayor, Dorin Danesan, turned out to be an enthusiastic supporter.

A dapper, 44-year-old engineer, the outspoken Danesan was convinced that Dracula would bring thousands of jobs to town. He soon persuaded his city council to cede 250 acres of land on the Breite Plateau, right in the middle of those magnificent oaks, in return for a percentage of the park's profits. "We've already had 3,000 applications to work in the park," he told me. "Everyone wants to profit from Dracula."

Maybe not everyone. A travel agent from a nearby town said many people feel that Dracula creates a "bad image" for Romania. Dorothy Tarrant, an American scholar who has worked in Sighisoara for years, said she feared that the park would become a magnet for cultists. "They've had a medieval arts festival here every summer since 1994," she said, "and it has degenerated from year to year. The place gets mobbed by young people with Satanic motifs, who are drinking and smoking pot and sleeping in the streets. I don't see how a theme park could be good for [families]."

Of course what many protesters feared was not just the park but the 21st century itself. Like it or not, modern-style capitalism will soon come barreling into Transylvania, and with it will come not only jobs, investments and opportunity, but also flash, tinsel and trash. There's already a disco just a few steps from Sighisoara's beautiful Clock Tower, and the basement of City Hall is home to a gaudy bar called Dracula's Club, which is announced by a bright-yellow awning, a huge mock-up of a paper cup bearing a Coca-Cola logo, and a heavy rock beat. How long will it be before Sighisoara takes on the carny-town atmosphere of souvenir shops, cotton candy and tour buses? How soon before the local kids are gorging on vampireburgers and greasy French fries, or maybe cruising those quaint cobblestoned lanes for drugs?

Those were the kinds of anguished questions being asked not only in Sighisoara but worldwide, wherever aesthetes

Dracula Park is now slated for Snagov, a sleepy village near the Bucharest airport, and could open as early as the fall of 2004. This Snagov churchyard will likely be spared.

considered the matter. Last summer England's Prince Charles, an architecture buff and ardent preservationist, added his own influential voice to the rising chorus of dissent when he declared that "the proposed Dracula Park is wholly out of sympathy with the area and will ultimately destroy its character." Suddenly seized with doubt, tourism minister Dan hired a team of consultants from PricewaterhouseCoopers to make a feasibility study and retreated uncharacteristically into a shell of silence.

In November, Dan announced on national TV that Sighisoara would be spared after all, and he followed up in February by revealing that the town of Snagov, just north of the Bucharest airport, was now his choice as the park site. (Groundbreaking is planned for May.) Romania's intellectual and artistic community heaved a collective sigh of relief. The developers had lost; Transylvania had won. As for Dracula himself, it wouldn't have surprised anyone very much if the mocking sound of his demonic laughter could be heard echoing once again throughout the alleyways of the medieval citadel that, for now at least, has escaped his curse.

GETTING THERE

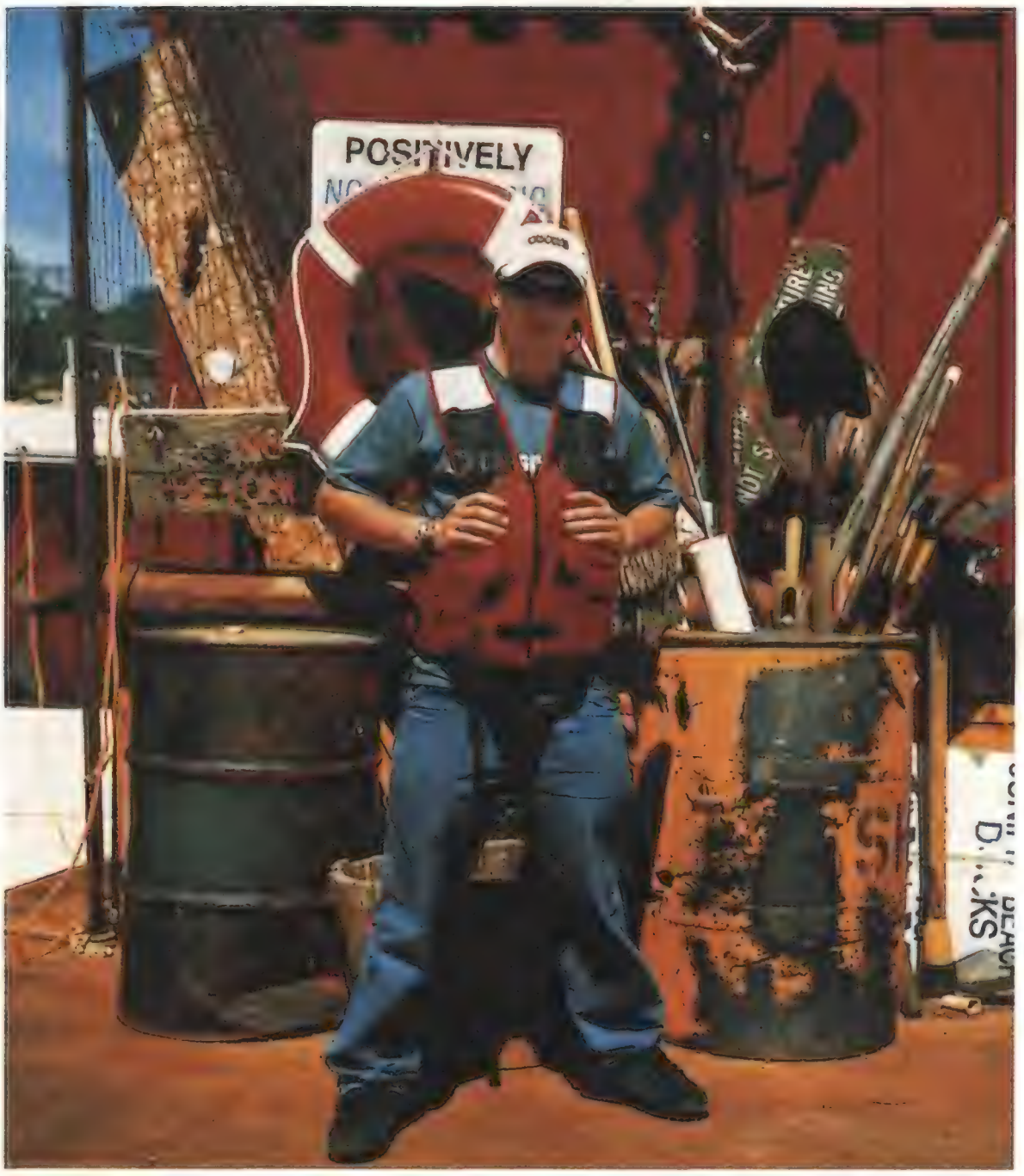
The Romanian Tourist Office in New York offers comprehensive information at www.RomaniaTourism.com. Maps and print brochures such as "Transylvania—Cultural Centers" and "Dracula—History and Legend" are available from the Romanian Tourist Office, 14 East 38th St., 12th Floor, New York, NY 10016; by calling 212-545-8484; or by e-mail: ronto@erols.com. Mini guidebooks and advice from recent travelers to Romania are available at www.lonelyplanet.com.

INSIDE TIPS: Visit Snagov soon, while there are still secluded picnic spots aplenty. The magnificent 16th-century church where Vlad Tepes is supposedly buried is on a nearby island in Snagov Lake. To get there, ask locals where on the lakeshore to find "Ana." For $1.30, she will take you to the island and back in her rowboat. Small pensions all around Romania are terrific bargains.

FOR THE GOURMET: If you're up for the ghoulish, try the cornball-spooky Dracula Club in Bucharest. The butter in their chicken Kiev is colored deep red. Other restaurants offer various versions of "stake" dinners.

Trash Talker

Chad Pregracke takes mucking up the Mississippi River very personally ~ BY STEVE KEMPER



"Sometimes people get upset if you take their trash," says Pregracke, who was once run off a piece of river property by a small man brandishing a large shotgun.

Brushed off by local and state officials, he grabbed a phone book one day, called a company named Alcoa ("because it started with an *A*," he says) and asked for the "top guy." He eventually talked Alcoa into giving him an $8,400 start-up grant.

AFTER RAMMING his flat-bottomed aluminum boat onto the muddy bank of a nameless island in the Mississippi River, near Grafton, Illinois, Chad Pregracke (pronounced pree-GRA-kee) leaps ashore with a shrill whoop. Within seconds, he has disappeared among logjams and high weeds, happily absorbed in his favorite outdoor pastime: collecting trash. The weather's hot, the mosquitoes are tearing him up and he's knee-deep in muck. Why is he doing this? Because he's a true-blue patriot, that's why. "As a national treasure, the Mississippi River is probably more famous than the Statue of Liberty," he says, not sounding the least bit hokey about it. "We wouldn't tolerate *all* this garbage in Yellowstone Park or on the Mall in Washington, D.C., so why should we put up with it here?"

For Pregracke, 28, nothing beats heaping his boat with river junk and hauling the whole filthy mess back to one of the three 135-foot-long barges he uses as sorting depots. He lugs soggy couches, cracked toilets, sinks, furnaces, microwaves, motorcycles and lawn mowers. He piles TV sets, bowling balls and freezers on top of propane tanks and huge slabs of Styrofoam. And, yes, occasionally he does come across a bottle with a message inside—usually, "return to sender."

It's hard to think of anything this boyishly enthusiastic clean-up crusader hasn't brought to light. The cooler with the severed horse's head inside was freaky. So were the two prosthetic legs and the rubber sex doll. The grisliest find of all turned up last summer when a Pregracke helper discovered a human head on an island just north of Fort Madison, Iowa. The local police

ALL: MICHEAL MCLAUGHLIN

eventually determined that it had belonged to a suicidal young man who had jumped from a bridge a year earlier.

Mary Alice Ramirez, the director of environmental outreach at Anheuser-Busch, the big beer company in St. Louis, remembers her first phone conversation with Pregracke this way:

He: "Will you give me some money?"

She: "Who are you?"

He: "I want to get rid of the garbage in the Mississippi River."

She: "Can you show me a proposal?"

He: "What's that?"

Ramirez invited Pregracke in for a meeting. When he showed up, the receptionist announced that some deadbeat was in the lobby. "He had a dirty T-shirt, ripped jeans, long hair and a sweaty cap," Ramirez says, "and he looked about 18."

Anheuser-Busch gave Pregracke $25,000 to help expand his Mississippi River Beautification and Restoration Project, which he was running out of his parents' house in East Moline, Illinois. That was in 1999. By now the irrepressible river rat and his ragtag crew have removed and recycled more than 800 tons of debris from the banks of the Mississippi and several tributaries between St. Louis and Minneapolis. They've also galvanized a couple of dozen towns in Iowa, Illinois and Missouri to undertake annual cleanups of their own. Because of Pregracke, groups that don't usually collaborate, such as the U.S. Army Corps of Engineers and environmentalists, now often find themselves working shoulder to shoulder. "We all have our own agendas, but Chad brings people together," says Christine Favilla, a project manager with the Sierra Club in Illinois.

It won't be long, if Pregracke has his way, before his motto "Coming to a river near you" will be spoken in many languages. Last year at an environmental conference in Johannesburg, South Africa, "I worked out a deal to bring 10 to 15 Russians over here in August to teach them everything I know—the right equipment, how to organize community cleanups," he says. "Next I'll bring some people from China."

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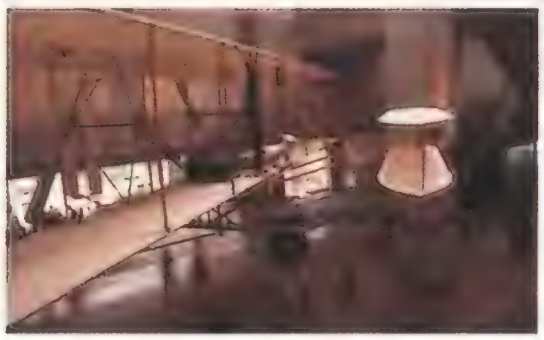

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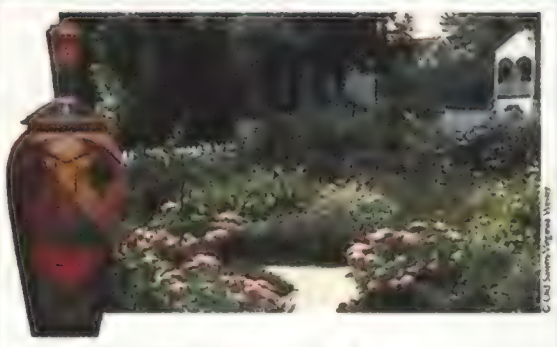

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Pregracke's log of hauled-out trash lists 8,272 tires so far, and still counting.

Pregracke grew up beside the Mississippi. From his boyhood home in East Moline, where his dad taught high school and his mom directed a child care program, he could take a few running steps and jump right in the water. He and his older brother, Brent, fished and dove for mussels. Nights they camped out like Huck Finn and Jim. Pregracke loved it, except for one thing: too many people treated the river and the shoreline like a dump.

During summers off from high school and community college, he worked as a commercial shell diver and photographed some of the Mississippi's worst eyesores. Brushed off by local and state officials when he tried to show them his pictures of the trash, he grabbed a phone book one day, called a company named Alcoa ("because it started with *A*," he says) and asked for the "top guy." He eventually talked Alcoa into giving him an $8,400 start-up grant. Using an old haul boat and a salvaged pickup truck, he took more than 20 tons from the Mississippi that first year.

Perhaps because Pregracke resembles the actor Tom Cruise and talks like a wired skateboarder ("Dude, you need to let me show you some pictures!"), a number of corporations have found his

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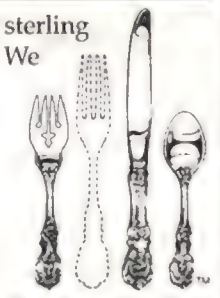

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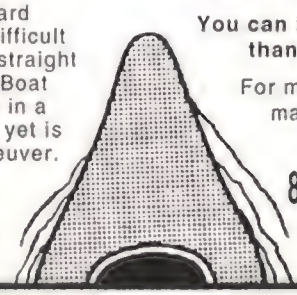

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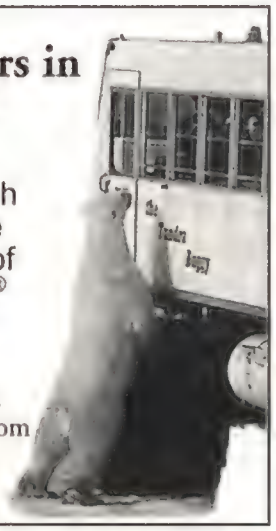

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charms persuasive. Today, his annual operating budget has mushroomed to more than $400,000. His motley fleet consists of a refurbished 20-year-old tug, five hauling craft and a houseboat that doubles as a dormitory and office, as well as those three big barges. Pregracke and his crew, which varies from three to six, start working in mid-February and don't quit until ice forces them off the water in December. Last year, assisted by thousands of volunteers, they got rid of more than 270 tons of trash.

Those who work for Pregracke, including girlfriend Lisa Eno, brother Brent and Margaret Abts, a recent biology graduate, make $1,500 to $1,800 a month. The boss pays himself the princely sum of $35,000 a year. They all live aboard the houseboat, where the perks will soon include plumbing and hot water; meanwhile they use portable toilets and bathe in the river. Pregracke rouses his colleagues early each morning by tugging on their toes and pushes them hard until dark.

Pregracke is patient as well as persistent. One day he spotted a huge raft of old Styrofoam floating downriver. He hauled it up to the marina that had dumped it. "I thought you might want this back," he told the startled owner. Next day, the same stuff came floating down the river again. "It takes a long time to change things," Pregracke says.

He knows trash is the least of the Mississippi's problems. "But I think getting people out removing barrels and tires is worth a lot because now they have a stake in the river. When bigger problems like siltation and runoff come up, they'll be interested. So half of this project is for the river and half is for the people."

The passion that led Pregracke to clean up the Mississippi now leaves him little time to enjoy it. Recently, he bought a new fishing pole, but his dog, Indy, chewed the handle off before he had a chance to use it. Not to worry, he says. "I really *love* my job." ○

STEVE KEMPER last wrote about skunk researcher Jerry Dragoo for these pages.

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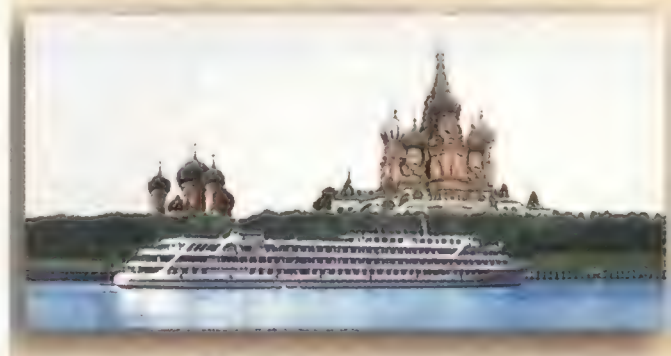

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The Stuff of Genes

Fifty years after the discovery of DNA's structure, the payoff hasn't matched the hype. But really, we've only just begun ~ BY HORACE FREELAND JUDSON

They found the "secret of life," said Crick (left, with Watson in Cambridge in 1953).

IN JANUARY 1953, deoxyribonucleic acid, DNA, was known to scientists numbered in the low hundreds. Its function puzzled, at most, a few score. The question of its three-dimensional molecular structure interested perhaps a dozen people. That structure was first visualized on the last day of February that year, at the Cavendish Laboratory, in Cambridge, England, by James Watson and Francis Crick. They published the first paper announcing the structure, the double helix, in the journal *Nature* in the issue dated April 25, 1953. They followed this up five weeks later with a second *Nature* paper on the structure's "genetical implications." The discovery was transcendent—it revealed a molecule simple, parsimonious, elegant to an extreme, and of shocking explanatory power. With these first papers it was already clear to that small world of scientists that we were on the way to understanding the nature and functioning of the material substance of genes—how hereditary characters are transmitted down the generations and how they are expressed in the development and differentiation, the building, of every organism.

So now we're marking the 50th anniversary of the publication of the structure of DNA. Is 50 years just a convenient round number, or does it have any significance, any resonance? As it turned out, the anniversary coincides with the closing of one era in molecular biology and the transition to a new one. This is, of course, the sequencing, nearly complete, of the human genome.

Of the founders of molecular biology, some have died: Max Delbrück, Rosalind Franklin, Jacques Monod, Linus Pauling, Max Perutz. Francis Crick lives: theorist and generalissimo of the golden age that followed the discovery of the structure, since the 1970s he's been at the Salk Institute, in La Jolla, California, performing a similar role in a minor key for neuroscience. A uniquely powerful intelligence, at age 86 he is threatened by cancer but erect of carriage, clear of mind and serene of spirit. And Jim Watson? After the Nobel Prize, he turned administrator, building the Cold Spring Harbor Laboratory into a science and graduate training factory, and he remains a power and public gadfly of science, clumsy, intuitive, manic, fearless, often right, always awkward—in that fine French phrase, a *monstre sacré*.

DNA is a term on everyone's lips, in every day's newspapers and broadcast news accounts. (Recently, I saw a new line of modernistic furniture called "dna.") We are told relentlessly of the wonders that are beginning to flow from the sequencing and manipulation of DNA—from our detailed understanding of molecular genetics and from our growing skill at altering genes. The technologies of the gene have altered food crops, we are assured, radically increasing production. They have already changed organisms in stranger ways, so that goats and bacteria, for example, produce drugs. They may one day improve the diagnosis of various diseases. We are told that perhaps they will begin to offer cures for certain diseases. From the first years in the development of the

A. BARRINGTON BROWN / PHOTO RESEARCHERS

technologies of the gene, in the early 1970s, the hope arose that genetic disorders—those caused by a single gene that is missing or defective—could be cured by supplying patients' cells with the correct gene. After more than a quarter-century of fruitless efforts and the spending of hundreds of millions of dollars, gene therapy is becoming possible, though at absurd expense and with risks not yet understood. The next hope is insight, perhaps therapies, for diseases involving multiple genes, like cancers. At the least, we are told, the technologies of the gene will allow great improvements in preventive medicine, when the reading of appropriate stretches of an individual's genome will detect genetic susceptibilities to certain ailments. Then there's talk, still sotto voce, of making improvements in human hereditary characters by adding new genes to the germ line so that they are transmitted to offspring.

I'm not writing to advertise these wonders. The consequences of the discovery of DNA's structure reach far deeper. The technologies of the gene will drive at least two great political changes, in my view. The first: we will not be able to deal equitably with what the human-genome project can do for the health and medical status of individuals without moving to universal single-payer medical coverage.

PERRIN PIERRE / CORBIS SYGMA

"Generalissimo" Crick and "gadfly" Watson (in Paris in 1993) reunited on the double helix's 40th anniversary.

More startlingly, recall what the governor of Illinois, George Ryan, did on January 10 and 11 of this year, just as he was leaving office. He pardoned four men who had been convicted of murder and condemned to die, and commuted to prison terms every one of the other death-penalty sentences in that state. Ryan had been a defender of the death penalty. His was an act of conscience and courage. But the new evidence that the death penalty kills innocent people—this evidence comes mainly from the large number of cases in which DNA identifications have exonerated prisoners on death row. The practical, the political, and the ethical and moral arguments against the death penalty haven't changed—nor have they changed public opinion much in the last half century. But now for the first time we have irrefutable scientific proof that the death penalty frequently produces irremediable injustices.

My real interest, though, is in another consequence, of a vast and en-

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tirely different order. First, a bit of history: in the summer of 1945, Vannevar Bush, an electrical engineer who was formerly vice president of MIT and director of the wartime Office of Scientific Research and Development—where he oversaw the improvement of radar, the mass production of penicillin and sulfa drugs, and the development of the atomic bomb—delivered to President Harry Truman a report titled *Science: The Endless Frontier*. Bush believed that basic research is technology's feedstock and was convinced that after the war the federal government would have to continue to organize and pay for scientific research and the training of new scientists. He called for and predicted the astonishing, high-exponential growth of the enterprise of the sciences that we have all witnessed.

The uniquely compelling part of Bush's proposal, though, was not just its assertion that basic research would produce practical payout, but that we cannot predict how long that will take, and from what particular lines. What a license for curiosity! Biologists, molecular, cell, and biomedical biologists, have been living that ideology ever since. The promise of medical advances has generated ever larger budgets.

Now, however, molecular biology is beginning to tell us things that reach beyond the practical, beyond the political, to touch and reshape our understanding of who we are and how we came to be. Since the dawn of human time, every culture has searched for stories of origins—of the universe, of the solar system, of life, of species, of humans, of language, of civilization. With gathering momentum for more than a century, science is telling better, more comprehensive, more grounded, more verifiable stories of origins.

Molecular biology has one of the greatest origin stories as yet untold—and it is now unfolding through the coming together, the fusing, of the two separate kinds of questions that have been fundamental in the century and a half since Mendel and Darwin. Biologists have always pursued questions of *how*, and these are about physiology—

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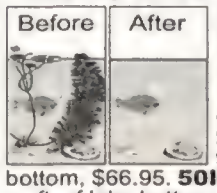

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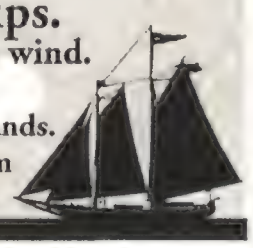

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how creatures reproduce, eat, run around. Increasingly since the discovery of the structure of DNA, these questions have been approached in terms of the functioning of genes. Biologists have also been occupied with questions of *why*. These are about the ways we, and all other creatures, have come to have the traits and behaviors we do. "Why" questions in biology are about adaptation or extinction, the changes in species in the struggle for existence across the immense depths of geological time: in other words, they are about evolution.

Recall that not just the human genome has been sequenced, but bacteria and roundworm and fruit fly and mouse and soon chimpanzee and more, genomes over the entire range of living creatures. Now we can match these genomes up, in a new science, comparative genomics, which is just beginning to yield in full detail the fusion of genetics and evolution—of how and why. One quick example: molecular biologists in England and Germany recently discovered a DNA sequence or gene that appears essential to the human ability to use language. The sequence controls the action of a cascade of genes, affecting several functions. (Nobody said this was going to be simple.) Some members of a large family are afflicted with a single mutation in this DNA sequence that severely limits their ability to use words, to learn and employ normal syntax. Chimpanzees have that gene sequence, too—but it is slightly different from that in humans. In such discoveries lie what my friends the biologists ought to be advertising. Here are the transcendent answers we will thrill to. Darwin said it, in the poignant last paragraph of *The Origin of Species*: "There is grandeur in this view of life." Here is the triumph of the scientific worldview. ○

HORACE FREELAND JUDSON is author of The Eighth Day of Creation, *a history of molecular biology, and director of the Center for History of Recent Science at George Washington University.*

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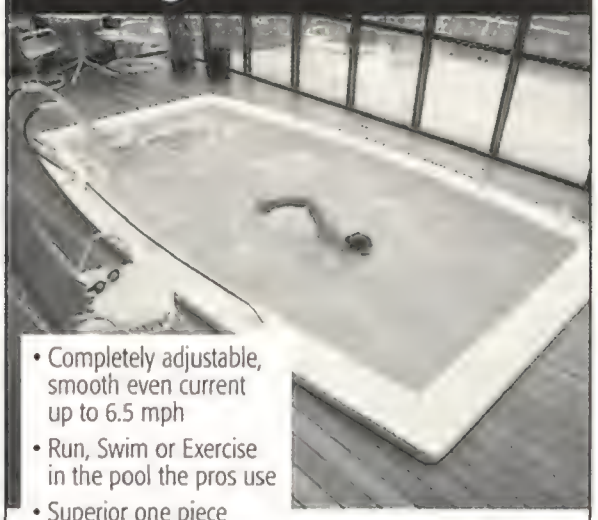

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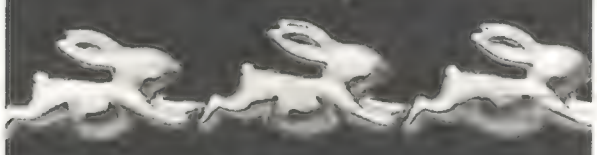

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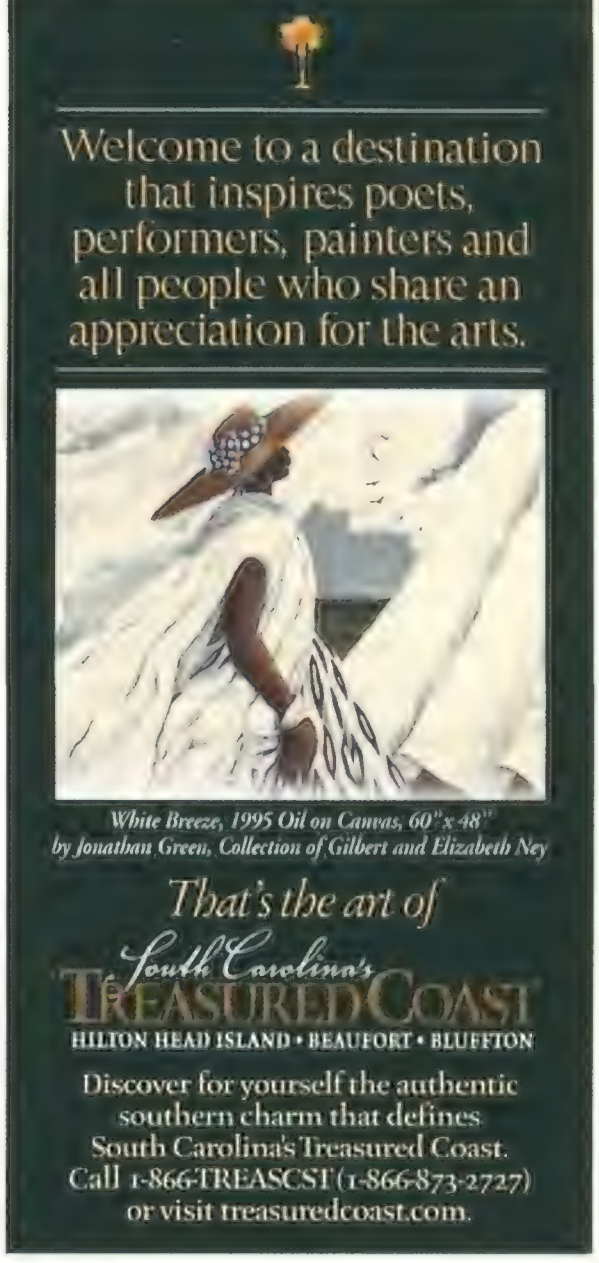

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SADDAM: KING OF TERROR

CON COUGHLIN

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OVER FOUR DECADES, Saddam Hussein, who was born in 1937, raised himself from his origins as a fatherless and impoverished child near Tikrit, 90 miles north of Baghdad, to become supreme ruler of Iraq. As reported by Con Coughlin, executive editor of London's *Sunday Telegraph* and a correspondent who covered Islamic terrorism and the Middle East for more than 20 years, it is a chronicle of violent advances and reversals, a Horatio Alger saga inscribed in blood. "Writing a biography of Saddam Hussein," Coughlin says, "is like trying to assemble the prosecution case against a notorious criminal gangster. Most of the key witnesses have either been murdered or are too afraid to talk." He drew on intelligence gathered by Western governments as well as interviews with numerous Iraqi refugees, defectors and exiles, including former generals, political officials, bodyguards and childhood friends.

In Coughlin's chilling account, one scene—Hussein's handling of a treacherous assignment in 1968—stands out as a turning point in the tyrant's career. If he had moved too abruptly or too slowly—if he had so much as stumbled—"the history of Iraq could have been very different," Coughlin writes. Hussein might have been swallowed up in violent obscurity, as were a succession of others who attempted to seize power after the British helped install a puppet regime in Baghdad in 1922.

The moment came two weeks after a coup that Hussein helped to engineer. He was then a second-tier member of a radical movement known as the Baath (meaning renaissance) Party, dedicated to merging Iraq and Syria in a secular federation against Israel. The Baathists wanted to acquire modern technology—most notably the technology of war—but also to maintain Arab tradition. At the same time, they were passionately opposed to the rule of either Marxists or mullahs. Twice, the Baathists toppled corrupt governments in Iraq during the 1960s.

In the first coup, in 1963, they got help from disaffected Iraqi generals and the U.S. Central Intelligence Agency, which welcomed the Baathists' anticommunist line. The coup was bloody, and it turned out badly for the Baathists.

The generals who had provided the muscle, Coughlin explains, later dumped the Baathist leaders, pushed aside their reforms and consolidated the power of their own leader, Abdul Salam Arif. In the turmoil, some of the insurrectionists, including Hussein, were imprisoned. (Hussein was incarcerated for two years.) But within a few years, the Baathist outcasts had regrouped under Ahmed Hassan al Bakr—a native of Tikrit, a clansman and political godfather to Hussein. They enlisted a new crop of generals to join their conspiracy.

The second coup, less bloody than the first, succeeded on July 17, 1968. Bakr became president and made Hussein head of Baath internal security, in recognition of his Tikrit ties and his reputation as a tough guy. (One of Hussein's first political acts, ten years earlier, had been to kill a Communist official in Tikrit.)

This time around, Bakr and his advisers wanted to make sure that the generals who put them in office would not be able to do unto them. This coup-within-a-coup required cunning and brutality. For this task, they turned to Hussein.

Targeted for removal were two high commanders: Abdul Razzak Nayif, the prime minister, and Ibrahim Daud, the defense minister. When the unwitting Daud left Baghdad to review troops in Jordan only 12 days after the coup, troops loyal to Bakr forcibly returned the defense minister to the Iraqi capital; Daud was then sent into exile in Saudi Arabia. The very next day, Nayif was invited to lunch in the president's palace. During the meal, Hussein entered the dining room with a drawn gun and bodyguards: "Saddam, according to his official biographers, was conciliatory. 'Nothing will happen to your children if you behave sensibly,' " he told Nayif.

After lecturing the prime minister on the error of "forcing himself" upon the new government, Hussein escorted him to the airport, from where he would be sent to Morocco as an unwilling ambassador. During the long ride in the limousine, Hussein—too poor and uneducated to get into the military himself—sat with a gun in his pocket, warning the distinguished military commander that a false move would bring instant death. He put Nayif on the plane, and then, the official account says, Hussein wept openly. The outburst represented, as Coughlin notes dryly, tears not of "regret but relief." Had Nayif's loyal staff been aware of what was happening, Hussein might well have been killed on the spot, and the Baathists thrown out.

Instead, with Hussein's help, Bakr acquired total control of the military. To the world, the machinations appeared bloodless. But, true to style, Hussein stealthily and brutally removed lingering threats. He adopted one of Stalin's favorite maxims: "If there is no person, there is no problem." Nayif, Coughlin writes, was "regarded as such a potential threat that, ten years later, in 1978, he was shot dead on Saddam's orders in London."

The list of those who met a similar fate at Hussein's hands is legion. Others in the Baathist movement realized

too late that they could not put a brake on Hussein. When Bakr announced his "retirement" in 1979, Hussein named himself president and commander in chief. There followed an infamous purge, in which the new president staged a confession of treason by the Baathist Party chairman during an official conference. As party members were denounced one by one from the podium, they were led from the hall before the eyes of terrified colleagues to be executed. "All those participating in the executions," Coughlin reports, "were personally provided with a handgun by Saddam, who led the way as the orgy of killing commenced." Hussein recorded the entire proceedings—including close-up views of pistols being discharged into temples—on videotape, which he then ordered circulated.

For sheer luridness, one later example of Hussein's style is worth noting. During a cabinet meeting in 1982, the health minister suggested that Hussein should stand down and let Bakr return to office to negotiate peace in Iraq's disastrous war with Iran. Hussein calmly got up and invited the minister to step outside with him to "discuss this matter further in private." After shooting the minister dead in another room, Hussein returned without comment to the meeting. Coughlin believes that Hussein then located a doctor who injected Bakr, by now an old man, with insulin, thereby inducing a coma—and permanently removing this final, irritating "problem."

By the early 1980s, when some in the United States embraced him as the hope for stability in the Persian Gulf, Hussein had imposed a kind of quiet on Iraq. Elevating his Tikrit clansmen, he brutally suppressed the Shiite Muslims in the south and the Kurdish minority to the north. (He terrorized the Kurds by gassing to death men, women and children in rebel villages.)

Hussein nevertheless opposed the fundamentalist government in Iran under Ayatollah Khomeni, whose mullahs had taken U.S. citizens hostage and were believed to have masterminded the bombing of the U.S. embassy in Beruit. In 1983, Donald Rumsfeld, then special Middle East envoy for President Ronald Reagan and now U.S. Secretary of Defense, visited Hussein on a mission of friendship. It is ironic, Coughlin notes, that Rumsfeld, a leader in the campaign to overthrow Hussein's regime, "played such a key role in helping to bring Iraq out of diplomatic isolation in the 1980s." The friendly relations broke down in the late 1980s. Hussein badly miscalculated when he invaded Kuwait in 1990, triggering what, in effect, has been more than a decade of war with the United States and the West.

Coughlin does not offer direct evidence of Iraq's role in the September 11 terrorist strikes against the United States. But he does note that "shortly before" the airliners hit the Twin Tow-

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ers and the Pentagon, Hussein ordered his forces on "Alert G," the highest level of readiness, and took himself to a heavily fortified bunker near Tikrit. It is not surprising, Coughlin suggests, that in the vengeful months that followed, "Saddam Hussein's Iraq soon emerged as one of the most likely targets for retaliation."

Reviewer ELIOT MARSHALL is based in Washington, D.C. and is an editor at Science *magazine.*

HEY, WAITRESS! THE USA FROM THE OTHER SIDE OF THE TRAY

ALISON OWINGS

UNIVERSITY OF CALIFORNIA PRESS, $29.95

EVER WONDER what waitresses have nightmares about? They can't deliver the food to their customers because the plates stick to their hands. Or the number of tables in the café keeps magically doubling. Or my favorite: the ketchup, forever unattainable, has mysteriously been spirited away to an impenetrable forest.

Alison Owings gives us these and other glimpses of life from "the other side of the tray" in this amusing, sometimes insightful attempt to describe the lot of waitresses in a society that seldom appreciates them. Waitresses, as Owings notes, are often on the skirmish lines of history.

"They watch, witness or are part of every upheaval, uproar, tradition, trend, debate and issue. . . . Everything that happens in this country happens on a waitress's shift."

One of the first salvos in the great civil rights campaign of the 1960s, for example, was fired at a lunch counter in Greensboro, North Carolina, when black students defied local custom by boldly sitting down and ordering a piece of apple pie. Owings gives us a waitress's-eye picture of the ensuing confrontation, which ended in victory for the protesters after several months of

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sit-ins. We hear from white waitress Ima Jean Edwards, who carried out the serve-no-blacks policy despite reservations about it—"My feeling was, I don't see *why* they have to be treated different"—and from black kitchen worker Geneva Tisdale, who was among three Woolworth employees who successfully got served—in her case, with an egg salad sandwich and a soda. "We worked there and we couldn't sit at the counter," she recalled of the days before the protests changed everything. "We were the ones fixing all the food."

Owings introduces us to all manner of waitresses, from ex-debutantes and PhDs to drug addicts and virtual slaves. They talk about customers, bosses, tips (oh do they talk about tips), the tricks of the trade, their special language and more. Does it surprise you to learn that most waitresses consider women better tippers, that wiseacres will sometimes leave written, nonnegotiable tips on the order of "Clean your windows with vinegar and water"?

The weakness of this good-natured fling at quasi-anthropology is a certain absence of selectivity. The author should have left out some of the whinier and more repetitious waitresses and zeroed in more tightly on those with more perceptive stories. Behind all the venting lies an important point: waitresses suffer not so much from sexism or racism but classism; too many people assume that they are of a lower social order, without skills, beneath conversation and consideration. They are blown off, underpaid and disregarded.

There are triumphs too. Chicago Pump Room waitress Reka Nagy recalls the time that she and a manager collided and both fell to the floor, Nagy still clinging to her drink-laden tray and miraculously averting spillage; customers cheered. Joanne Mulcahy tells how she and her fellow servers at a French restaurant in Philadelphia got even with their miserly boss by popping scallops from customers' plates into their own mouths. ○

Reviewer DONALD DALE JACKSON *lives in rural Connecticut.*

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Playing by Ear

People say the darndest things.
At least I think they do – BY TED GUP

OK, I'M IN A RESTAURANT and the waiter asks me if I would like marbles on my pizza.

"Sir, you are perfectly mad," I'm tempted to say, a derisive grin on my face. "Who do you know who eats marbles on a pizza?" Instead I suppress my howls, cup an ear in the speaker's direction and wait for the next zinger.

These days, bizarre questions like the waiter's are commonplace. You see, at 52, my hearing is slipping. It's not that I'm deaf, I just don't hear as well as I once did. The other night, in the midst of a heated debate about the Middle East, someone asked me why his duck turned bank robber. Another serious discussion hijacked. In my mind I imagined a mallard, a Beretta in his bill, waddling out the bank door. I tried to smother my laugh.

Now you might think I would be upset about this turn of events. But to be honest, at least for the moment, I find it amusing. I was getting a tad bored with the predictable arc of conversation, the déjà vu of most tête-à-têtes. These days, I scarcely know what anyone is going to say as conversations veer off in all directions. Not even Lewis Carroll could have imagined such absurdity. The silliness that comes out of the mouths of the pompous, the profanities that angel-faced children blurt out; no, I wouldn't trade it for the world.

In fact, I can't even bring myself to ask for clarification. Who knows, maybe it was "olives," not marbles, the waiter was offering; a bit more digestible perhaps, but not nearly as colorful as a good cat's-eye. As for that sober talk of the Middle East, it was probably not *a* bank but the *West* Bank that got twisted into a canard, if you'll pardon the pun. Maybe, if I could compose myself—which I can't—I might get out a "What?" when these inanities are uttered. But why spoil the fun? Only if others repeat themselves is the matter made clear.

"What kind of cheese do you like?" asks my 12-year-old as I bring in an armful of firewood. "Cheddar, feta, Swiss," I respond. "I hate blue and Gorgonzola." He looks at me with bewilderment. "Daddy!" he scolds. "What kind of *trees* do you like?" Oops.

It's not always easy keeping a game face. The other day I was sitting in a somber faculty meeting, yawning at talk about rhetoric, when all of a sudden an esteemed colleague disclosed that his gums are shiny. Next thing I knew I was snickering in the corner, barely able to control myself. All eyes were upon me. What could I have said, that I was chuckling over the idea of shiny gums? I think not. Besides, it's my good fortune to find any humor in a faculty meeting.

Of course, in my other profession, that of journalist, creative ears can be something of a liability. A little word like "not" falls by the wayside, and next thing I know I have an exclusive story that has eluded all my younger colleagues. A fellow I interviewed not long ago about the CIA whispered that the Agency was secretly planning to turn Osama bin Laden into a lamp for orchards. Now, who, I ask you, came up with that ingenious plan?

My wife, poor soul, suffers the most. She's constantly having to repeat herself, a habit she perfected even before my recent impairment. She suggested I get my ears tested (at least I think that's what she said). But why would I give up so special a gift? This is, after all, my revenge on the world. I've always felt it didn't understand me, that I was the one getting the sideways looks and raised eyebrows. Well, my friend, what's good for the goose is hood for the panda, if you get my meaning.

JOHN KLEBER

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In South Africa, you really *can* go on safari. Once, safari was the province of game hunters and the privilege of aristocrats. Now, anyone can traverse the wild lands, where animals from storybooks and zoos come so close, unhindered, that you can see the feral gleam in their eyes.

It is amazing that such untouched natural wonder thrives mere moments from civilization, but it does, thanks to private game reserves like the Sabi Sand Game Reserve, the Manyeleti Game Reserve, and the Timbavati Game Reserve.

And yet, not far from this wilderness teeming with life, you can find all the modern comforts you're used to, along with a few flourishes that you might not expect.

It's hard to believe this was once a nation torn apart by apartheid and whose first president, Nelson Mandela, was a political prisoner for 27 years. In spite of this, or perhaps because of it, the people of South Africa go out of their way to be helpful and kind. From the time your plane lands to the time it lifts off, you will encounter a smiling, easygoing people with hearts as big as the sun. Accommodations that are already luxurious will seem even more so given the hospitality of the people you will meet.

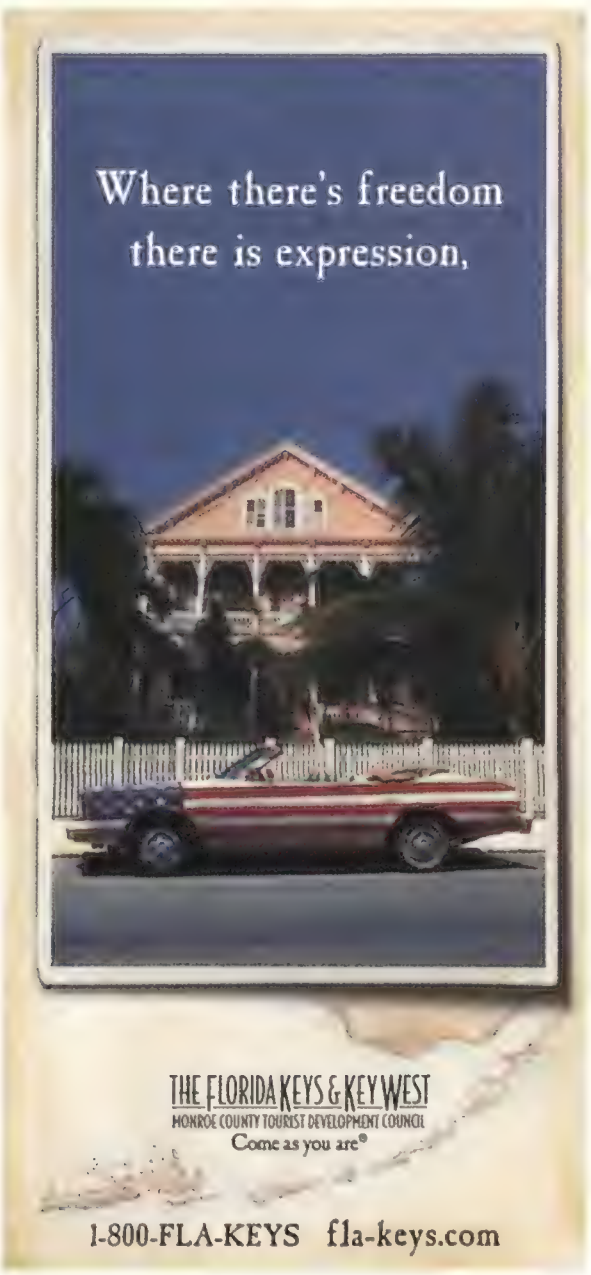
Somehow, the diverse post-revolution cultures of South Africa have found a way not merely to coexist, but to intertwine and build on each other, enhancing the experience of visitors by adding even *more* color to the colorful, even *more* flavor to the flavorful, even *more* excitement to one of the most exciting places on earth.

Such diversity, color, flavor, and excitement can be found every day in South Africa's countless marketplaces and restaurants. Vendors everywhere – in flea markets, bazaars, even mall shops – sell a variety of African jewelry, arts, and crafts. The influence of many disparate nations and cultures is evident in the delicious cuisine. And at many of the dining establishments, you may taste an incredible wine fermented on an estate only a few miles away. All of this is at an unprecedented value because the American dollar is stronger in South Africa than ever before.

Every city in South Africa is its own experience, with sights, sounds, and tastes that make it distinct and memorable. In Cape Town, you can spot Southern Right whales frolicking in the ocean, sip wine at a country estate, or take in fantastic views from Table Mountain and Chapman's Peak. In Johannesburg and the township of Soweto, you can

Photos: ©South African Tourism

From breathtaking vistas to jewel-toned townships, South Africa is more than a destination – it's an experience.



see the physical manifestation of the nation's evolution, from the Hector Peterson Memorial to glittering new casinos and theaters. In Durban, you can sample authentic Indian cuisine, as hot as you can stand it, and buy Indian spices and Zulu crafts in shops which are side by side.

Wherever you go in South Africa, there's no place like it on earth.

And always, *always,* an untamed lion lurks in the bush nearby....

For the latest travel offers, call South Africa Tourism at 1-800-782-9772 or visit www.southafricanstories.com.

Finland
FOLLOWING THE PATH OF KINGS

Over 700 years ago, powerful merchants as well as the emissaries of kings and czars walked the King's Road, which winds its way along the Southern coast of Finland from St. Petersburg, Russia to Stockholm, Sweden and Oslo, Norway, and passes through the Finnish capital of Helsinki.

The culture, the history and the sense of adventure they left behind still fills the landscape of Southern Finland today, making the King's Road an excellent choice for the vacation adventure of a lifetime.

The variety of tours and travel packages and their endlessly interchangeable features mean visitors to Finland can create their own unique vacations, finding the adventures *they* want to have and seeing the wonders *they* want to see, be it the wealth of roadside inns and taverns and the long sun-filled days of summer.

You can travel by car, bus, train or bike from city to city, including medieval Turku, the former capital of Finland, and Helsinki, where 87 years ago, the nation's new democracy was born.

You can see the integral history of Finland up close and taste local culinary delights on the King's Road Culinary Bike Tour. You can photograph your memories in outlandishly different settings – from the vibrant plazas of the King's Road to the spectacular archipelago.

Visit Finnish cider farms and breweries. *Visit* cities like Turku, Rauma, and Porvoo, where centuries-old architecture remains intact. *Visit* the land where nightclubs and jazz can be found near castles and cathedrals, the land where the wonders of nature loom beautiful and majestic everywhere you look.

Tread the route of royalty through Finland's majestic King's Road.

Visit Finland, and follow the path of kings.

For further information, call the Finnish Tourist Board at 212-885-9700 or 800-FIN-INFO, or log on to www.gofinland.org, www.finlandkingsroad.com, or e-mail mek.usa@mek.fi.

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At Jackson's Mill, you can stand next to the water and imagine Thomas Jackson standing there a hundred and fifty years ago as a little boy – years before he would become the leader of the Confederate Army and earn the nickname "Stonewall"....

Photos: Finnish Tourist Board

Explore it your way.

The King's Road is the ancient route of royalty between Scandinavia and Russia. You can explore it on your own or with a tour program, by car, train, bus, bike or ship. Discover the history, culture and beauty of Finland. It's a trip fit for a king.

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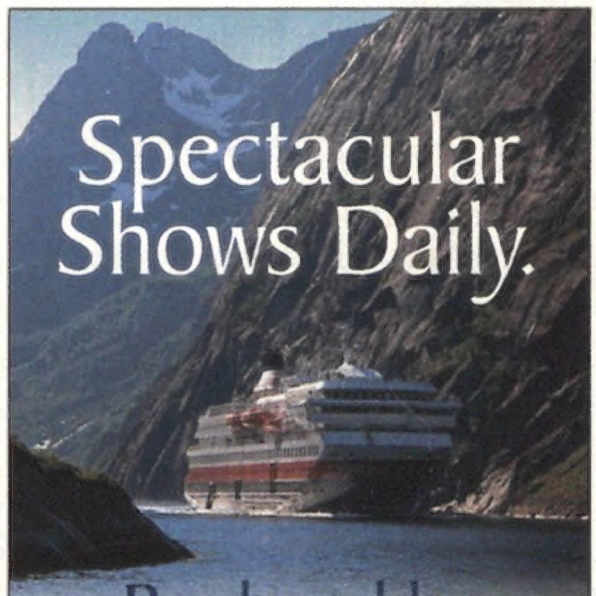

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BERGEN LINE SERVICES

These are just a few of the exciting things you can see and do as you explore West Virginia. And if you live anywhere in the United States east of the Mississippi, these things – and much, much more – are all less than a single day's drive away.

The Appalachian Mountains dominate the eastern side of the state, creating an uncompromised environment in which thousands of wildlife species thrive. For those seeking the thrill of outdoor adventures, they also create a paradise for hikers, white-water rafting fans, and nature lovers. In fact, over 200,000 acres of the state are state parks, national forests, and wildlife management areas.

With no fewer than seven ski lodges and resorts, which support all types of skiing from cross-country to snowboarding, the "Mountain State" of West Virginia is a ski lovers' paradise as well.

Those looking to play a round of golf on award-winning courses need look no further: six of the most famous and best designed golf courses in the Mid-Atlantic region are nestled in the mountains and foothills of this beautiful state.

Finally, for those curious about United States history – particularly its Civil War heritage – historical sites abound. After all, West Virginia played a pivotal role in the Civil War, being the Confederate State that lay closest to the Union.

And when you've had your fill of adventure and history, exquisite

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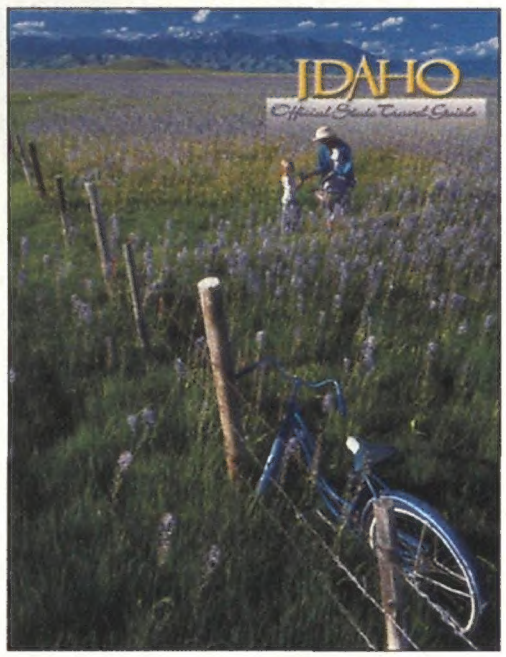
Follow Lewis and Clark on your own voyage of discovery in Idaho.



Here, you can see what Lewis saw and walk where Clark walked. Stop along the way and pick some berries, raft a river or dance under the stars.

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Lewis and Clark slept here, but you can still use their room.

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A dugout canoe at a Nez Perce interpretive site along the Clearwater River in north central Idaho.

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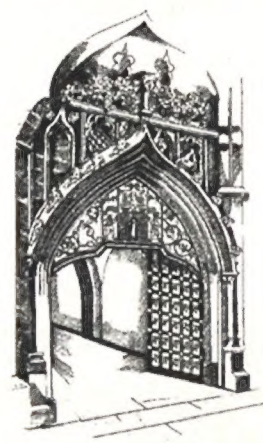

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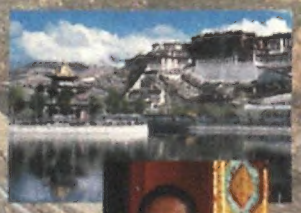

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William Kenyon is a poet, teacher, freelance writer, and PR specialist based in Atlanta.
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